DOCUMENT RESUME

ED 234 069 TM 830 548

TITLE	California Achievement Test Results. Grades 1-6. 1981-1982. Tech Memo.
INSTITUTION	Mesa Public Schools, AZ. Dept. of Research and Evaluation.
PUB DATE	11 Oct 82
NOTE	65p.
PUB TYPE	Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Achievement Gains; *Achievement Tests; *Educational Legislation; Elementary Education; Feedback; Language Arts; Mathematics; *National Norms; Reading; Standardized Tests; State Legislation
IDENTIFIERS	*California Achievement Tests

ABSTRACT

The California Achievement Test was administered to the students of the Mesa Public Schools in April, 1981, and again in April, 1982. This state-mandated test is administered to all students in grades 1 through 12. Although this report is directed toward the performance of Mesa students at the elementary level, a general overview of the performance of all Mesa students is included. Information is presented in terms of grade equivalence scores, percentile rankings, stanines, and scale scores. Norm values are also presented. Mesa's performance, considering scale scores, is well above that of the national sample in all areas (i.e., reading, grammar, and mathematics) and at all grade levels. Overall performance summed over grades indicates the students are doing extremely well in all curriculum areas, but a little better in math, with grammar a close second and reading somewhat below the other two areas. Using a comparison between the school mean and the national norm mean for schools and a comparison between school performance in 1981 and school performance in 1982, a number of schools indicated excellent performance on both criteria. An attempt was made to identify those schools that did not fit into these categories. (PN)

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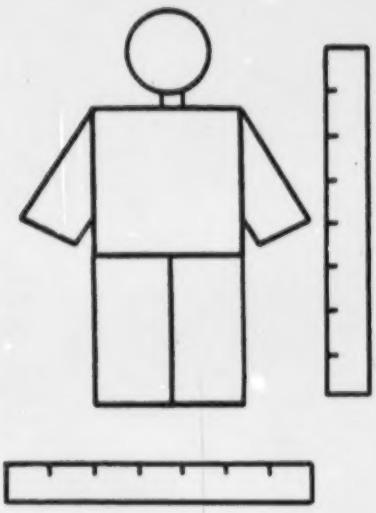

MESA PUBLIC SCHOOLS

research and evaluation

ED234069

TECH MEMO

CALIFORNIA ACHIEVEMENT TEST RESULTS

GRADES 1-6

1981-82

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TM 830 548

OCTOBER 11, 1982

INTRODUCTION

The California Achievement Test was administered to the students of Mesa Public Schools in April, 1981, and again in April, 1982. This testing complied with state legislation which mandates administration of a nationally standardized norm-referenced achievement test to all pupils in grades 1-12. This report presents a summary of the performance of students in grades one through six in Mesa. A second report is available which presents data for grades seven through twelve. This report includes a description of the California Achievement Test, a description of district performance and also a description of individual school performance.

DESCRIPTION OF THE CALIFORNIA ACHIEVEMENT TEST

The California Achievement Test measures achievement in reading, language, and math for grades one through six. Students in grades one through six take a different level or form of the test at each grade level. The different subtests of the CAT and the grade level at which they are presented follow.

Total Reading	Phonic Analysis (1-3) Structural Analysis (2-3) Reading Vocabulary (1-6) Reading Comprehension (1-6)
Total Language	Language Expression (1-6) Language Mechanics (2-6)
Total Math	Math Computation (1-6) Math Concepts and Applications (1-6)

The eight subtests are described briefly below. The grade level at which specific content is covered is included in the description.

TOTAL READING

Phonic Analysis (grades 1-3)

This subtest includes items that require the students to recognize sounds of single consonants (1), consonant clusters (1-3), consonant digraphs (1-3), variant single consonants (2), short vowels (1-3), long vowels (1-3), vowel combinations (1-3), vowel dipthongs (3) and variant vowels (3). The examiner reads a word and asks the students to identify the word that has the same sound (1-3) or the students read a word and choose a word that has the same vowel sound (2-3).

Structural Analysis (grades 2,3)

Items that measure specific skills in structural analysis are included in this subtest. These skills include forming compound words, identifying the number of syllables in a word, identifying the two words that form a contraction, and identifying base words and affixes.

Reading Vocabulary (grades 1-6)

This subtest is divided into sections. In one section some items require that students identify a word that best fits a specified category and other items require that students identify the same meaning for an orally given definition (1).

Another section requires students to identify the same meaning for an underlined word in a phrase (1-6). A third section requires students to identify the opposite meaning for an underlined word in a phrase (2-6). A fourth section requires students to determine the meaning of multimeaning words by using sentence context (3-6).

Reading Comprehension (grades 1-6)

The comprehension subtest contains different sections. Students may be required to identify a picture that is appropriate for a given sentence (1), read passages and answer items on literal, interpretive comprehension (1-3), and read items that measure critical comprehension and figurative language (3). Also included are sections of the test that requires that students read a variety of material. Depending on the level of the tests, this material may include biographical sketches, factual accounts, fictional passages, poems, speeches, advertisements, letters, editorials, commercials, or movie reviews. The items measure skills in literal, interpretive and critical comprehension (4-6).

TOTAL LANGUAGE

Language Expression (grades 1-6)

The subtest contains items that measure specific skills in usage. The test requires that students choose the word or words that best complete a sentence (1-3). The subtest for upper grades contains items that measure specific skills in language usage, sentence structure, and paragraph organization. The test requires students to do a variety of items that measure various skills related to effective written expression. Depending on the level of the test, the item types may include choosing the word or words that best complete a sentence; identifying the subject or verb of a sentence; recognizing sentences that are complete, incomplete, or run-on; recognizing a sentence that is most clearly expressed; determining the best order for a group of

four sentences; selecting sentences that best develop a topic sentence; or selecting the best concluding sentence (4-6). All items in this test are based on rules of written standard English.

Language Mechanics (grades 2-6)

The items in this subtest measure capitalization skills and punctuation skills. The capitalization section requires that students select the part of a sentence, if any, that needs a capital letter. The punctuation section requires students to choose whether or not one of the given punctuation marks has been left out of a sentence (2-6). All items in this test are based on rules of written standard English.

TOTAL MATH

Math Computation (grades 1-6)

This subtest includes items on addition and subtraction skills (1-6), multiplication skills (2-6), and division skills (3-6). Depending on the level of the test, the items may include operations with whole numbers, fractions, decimals, integers, or algebraic expressions.

Math Concepts and Applications (grades 1-6)

Items of this subtest measure specific skills in understanding and using mathematical concepts. The test requires that students recognize concepts and apply problem-solving operations in various contexts. Depending on the level of the test, the content may include numeration, number theory, number sentences, common scales, geometry, measurement, graphs (1-6), number properties (2-6), story problems (3-6), and functions (4-6).

USE OF TEST RESULTS

The information from the California Achievement Test can be used in a number of different ways. The primary purpose of the test is to provide feedback which will help students to increase performance in school. The data is also used to measure performance of schools. Again, the thrust is to improve the overall performance of the schools. The school information is in turn used to gauge the overall performance of the district. In all of these comparisons care must be taken in the interpretation of the results presented. No single statistic can completely define the performance of a student, school, or a district. All of the data must be synthesized and specific data must be gleaned from the totality of information in order to answer specific questions. The questions may be those of a teacher asking about an individual student, the district asking about particular schools, or the community asking about the district.

One of the important considerations to remember when considering the test results from the CAT is the variability in the data. For the classroom teacher, one of the important considerations is the standard error of measurement, the variability between a student's test scores if the same student is given the test at two different times over a short interval. This standard error of measurement ranges from a low of 8.3 at the second grade for Total Math to a

high of 32.9 at the twelfth grade for Language Mechanics. What this translates into is, if a student scored at the national norm mean in the second grade in Total Math, which is a scale score of 357 with a corresponding percentile rank of 50 and stanine of 5, it would not be unreasonable for the same student to score between 350 and 364 on a retest. These scores translate into percentile and stanine scores of 46 and 5 at the low end and 63 and 6 at the high end. Another way to look at this is that if a student scored average (50th percentile) on the first test, his or her chances are one out of five that the score on the second test would be at the 63rd percentile or above. A similar example can be given for a student performing on the Language Mechanics section on the 12th grade test. Again, taking the student's first test at the national norm value of 624 (50th percentile), his or her chances would be 1 out of 5 that on a retest the score would be at the 60th percentile or higher. The same chance, 1 out of 5, exists that the student score at the 40th or less on a retest.

As with individual test scores, variability should be considered when observing school means; in fact, in the case of school means, the actual norm values for the mean scores are different. When one is considering individual students the national norm mean for Total Reading is 312, however, if one looks at the national norm mean for the schools the mean Total Reading score is 316. Corresponding to this 316 is a standard deviation of 23.8. That means that 68% of the schools in the norm group are between ± 1 standard deviation

or between 292.2 and 339.8. Comparing schools to the national norm then should be done with care to insure that school means are being used and also the variability of the test results are taken into account.

RESULTS

Grades 1 through 12

Although this report is directed toward the performance of Mesa students at the elementary level, grades 1-6, it is felt that a general overview of the performance of all Mesa students is warranted. Tables 1-3 present the performance of Mesa students in Total Reading, Total Grammar, and Total Math for all grade levels. Information is presented in terms of grade equivalence scores, percentile rankings, stanines, and scale scores. Norm values are also presented. Figures 1, 2, and 3 present the results from these three tables in terms of scale scores plotted over the 12 grades.

Considering the results presented in Tables 1 through 3, it is quite evident that the Mesa Public Schools does exceptionally well in all areas and in all grades. Mesa's performance, considering scale scores, is well above that of the national sample in all areas, reading, grammar, and mathematics and at all grade levels. The performance of Mesa students in 1982 is also above that of 1981, again in all areas, and at all grade

Table 1

Mesa Students' Performance - Total Reading

Grade	Grade Equivalent National Norm	Grade Equivalent Mesa		Percentile Ranking (National percentile average is 50)		Stanine (National stanine average is 5)		Scale Score Mesa		Scale Score National Mean
		1981	1982	1981	1982	1981	1982	1981	1982	
1	1.8	2.2	2.2	68	70	6	6	334	336	312
2	2.8	3.3	3.4	62	65	6	6	383	387	366
3	3.8	4.2	4.2	63	64	6	6	425	426	406
4	4.8	5.3	5.4	58	61	5	6	460	464	446
5	5.7	6.5	6.7	63	65	6	6	496	499	474
6	6.8	7.8	7.9	62	63	6	6	526	528	503
7	7.8	8.7	8.9	64	67	6	6	554	559	526
8	8.8	10.0	10.1	60	65	6	6	578	587	556
9	9.7	10.8	11.1	62	66	6	6	600	608	574
10	10.7	11.7	11.9	59	60	5	6	620	623	599
11	11.8	12.9	12.9	58	60	5	6	639	645	622
12	12.6	12.9	12.9	60	59	6	5	658	655	632

Table 2

Mesa Students' Performance - Grammar (Language)

Grade	Grade Equivalent National Norm	Grade Equivalent Mesa		Percentile Ranking (National percentile average is 50)		Stanine (National stanine average is 5)		Scale Score Mesa		Scale Score National Mean
		1981	1982	1981	1982	1981	1982	1981	1982	
1	1.8	1.9	1.9	57	60	5	6	374	377	336
2	2.8	3.3	3.5	62	70	6	6	425	437	406
3	3.8	4.4	4.6	62	66	6	6	470	477	450
4	4.8	5.9	6.4	62	67	6	6	506	514	485
5	5.9	7.3	7.9	66	71	6	6	534	543	506
6	6.7	8.4	8.6	67	69	6	6	557	561	523
7	7.8	9.0	9.6	64	68	6	6	569	578	542
8	8.8	10.2	10.5	61	64	6	6	588	596	566
9	9.7	10.9	12.3	61	70	6	6	605	625	580
10	10.7	12.2	12.2	60	60	6	6	624	624	600
11	11.8	12.8	12.9	55	58	5	5	631	639	620
12	12.7	12.9	12.9	51	54	5	5	633	640	629

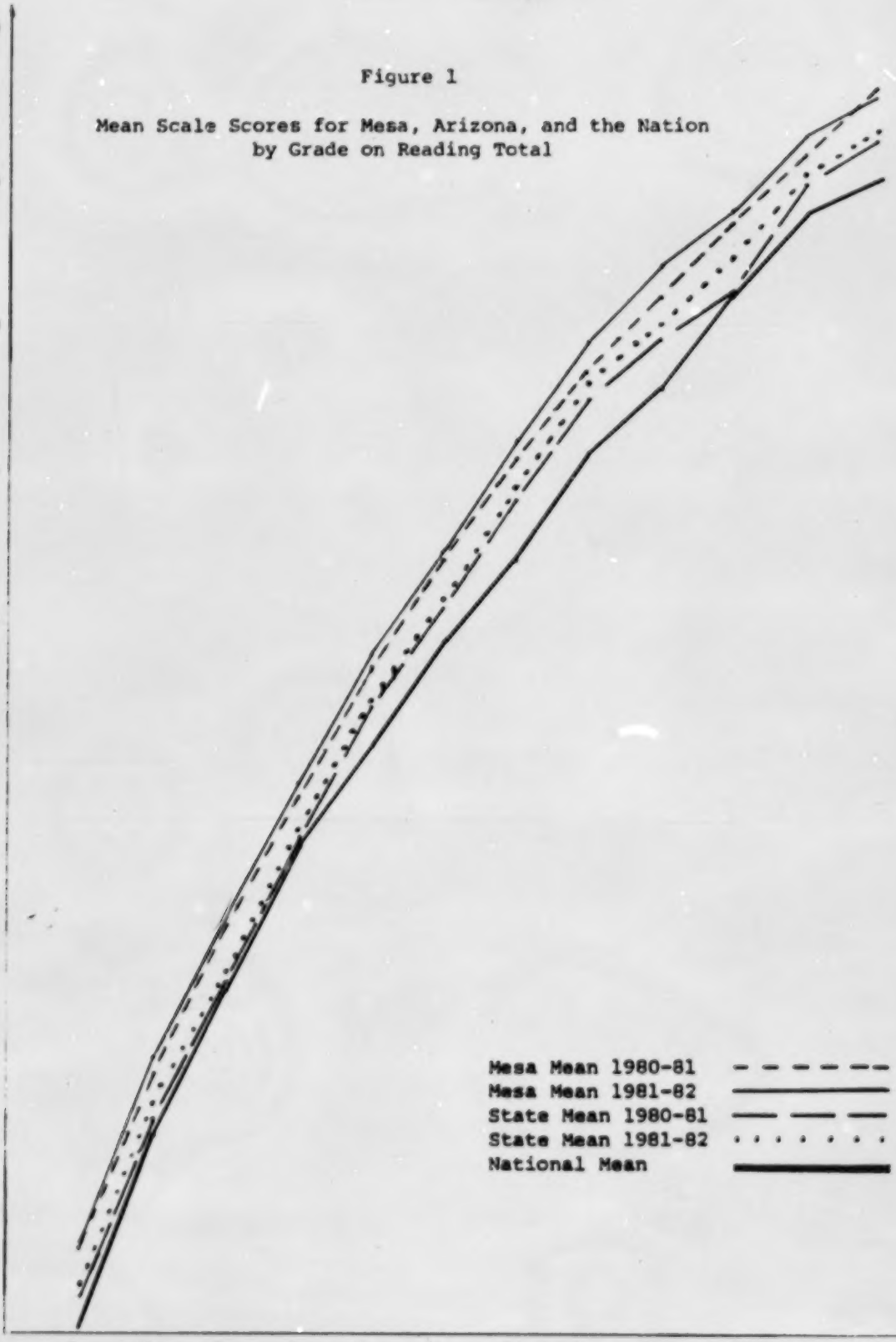
Table 3

Mesa Students' Performance - Math

Grade	Grade Equivalent National Norm	Grade Equivalent Mesa		Percentile Ranking (National percentile average is 50)		Stanine (National stanine average is 5)		Scale Score Mesa		Scale Score National Mean
		1981	1982	1981	1982	1981	1982	1981	1982	
1	1.8	2.1	2.2	69	73	6	6	331	334	318
2	2.9	3.2	3.3	58	66	5	6	364	370	357
3	3.8	4.0	4.2	54	59	5	5	405	410	399
4	4.8	5.1	5.3	55	61	5	6	440	448	434
5	5.9	6.2	6.5	57	62	5	6	477	484	467
6	6.8	7.8	8.0	67	70	6	6	522	527	496
7	7.8	8.9	8.9	70	71	6	6	559	561	521
8	8.9	10.0	10.6	67	70	6	6	593	600	559
9	9.8	11.6	12.5	66	68	6	6	614	619	580
10	10.6	12.9	12.9	62	62	6	6	628	628	600
11	11.9	12.9	12.9	57	60	5	6	631	640	617
12	12.9	12.9	12.9	54	58	5	5	631	642	623

Figure 1

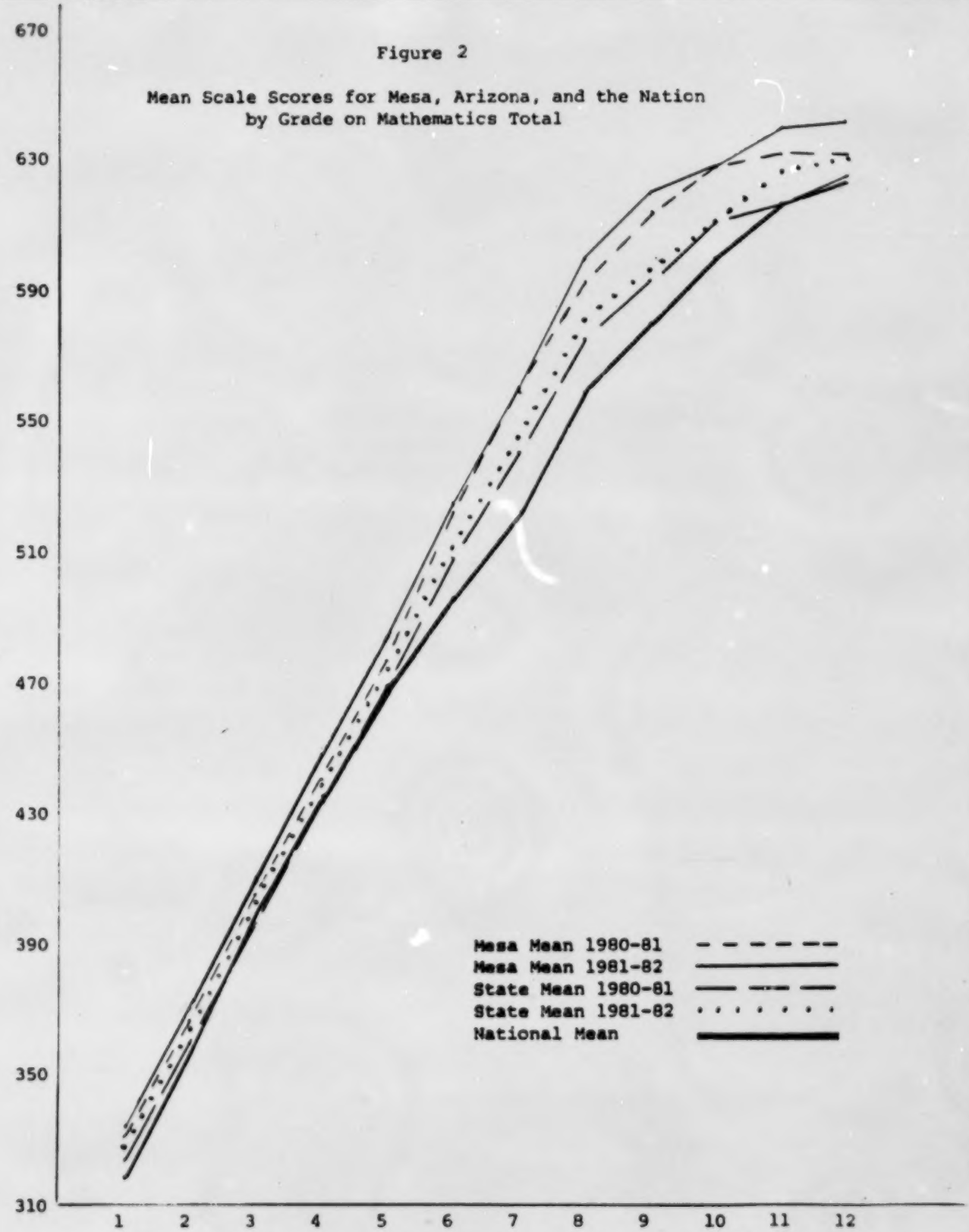
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Reading Total



	1	2	3	4	5	6	7	8	9	10	11	12
Mesa Mean 1980-81	334	383	425	460	496	526	554	578	600	620	639	658
Mesa Mean 1981-82	336	387	426	464	499	528	559	587	608	623	645	655
State Mean 1980-81	321	370	407	449	485	513	543	571	588	611	631	643
State Mean 1981-82	324	374	411	451	487	515	546	575	592	610	634	64[illegible]
National Mean	312	366	406	446	474	503	526	556	574	599	622	63

Figure 2

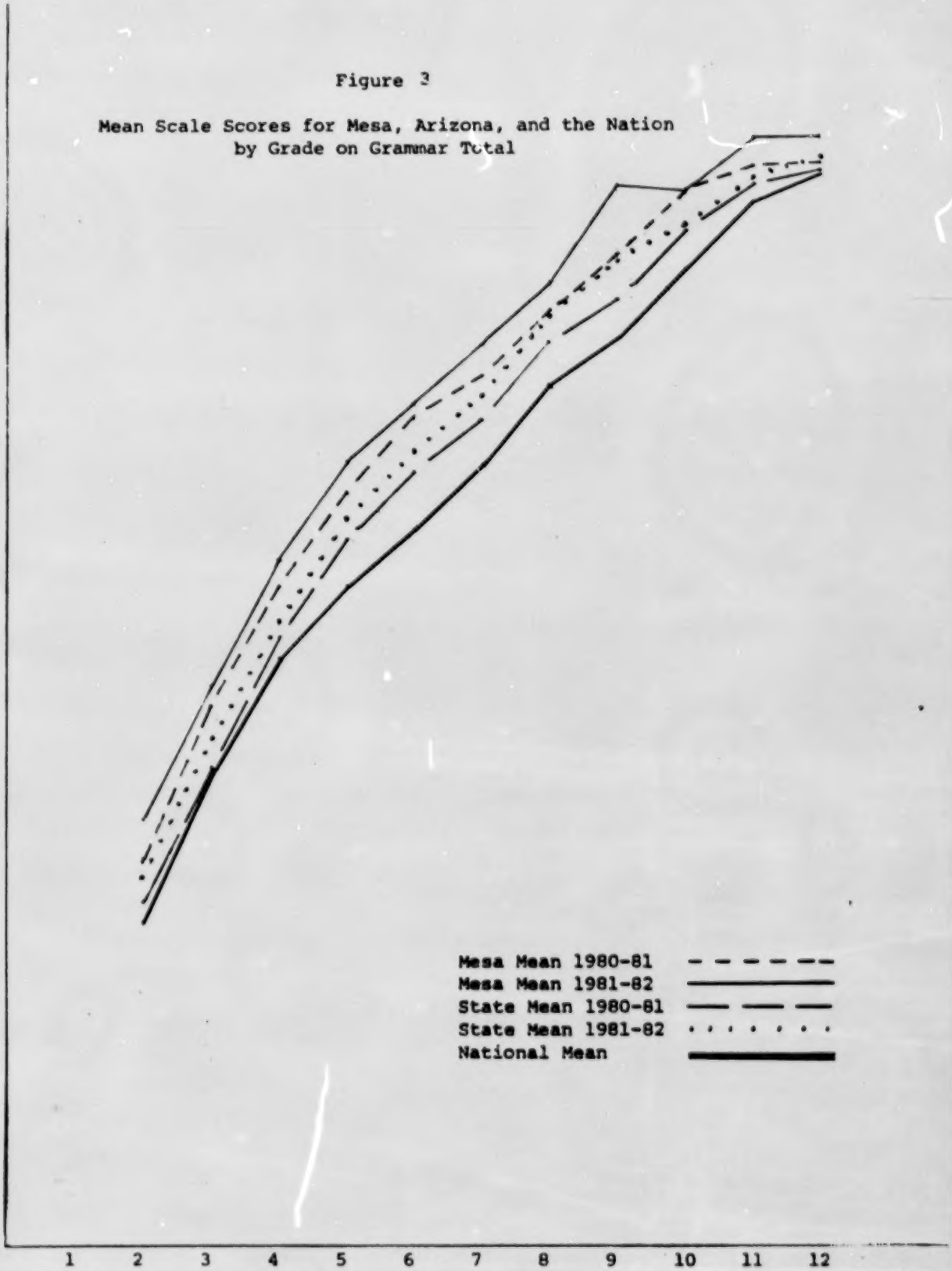
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Mathematics Total



Mesa Mean 1980-81	331	364	405	440	477	522	559	593	614	628	631	631
Mesa Mean 1981-82	334	370	410	448	484	527	561	600	619	628	640	642
State Mean 1980-81	323	359	397	434	469	508	541	575	593	611	622	625
State Mean 1981-82	327	364	402	438	474	512	545	581	596	611	626	630
National Mean	318	357	399	434	467	496	521	559	580	600	617	623

Figure 3

Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Grammar Total



Mesa Mean 1980-81	425	470	506	534	557	569	588	605	624	631	633
Mesa Mean 1981-82	437	477	514	543	561	578	596	625	624	639	640
State Mean 1980-81	411	451	491	520	540	556	579	591	612	626	630
State Mean 1981-82	419	461	496	526	546	563	586	603	614	628	634
National Mean	406	450	485	506	523	542	566	580	600	620	629

levels with the one exception of Total Reading at the 12th grade, where the performance drops slightly. Considering the scale scores presented in Tables 1-3 and shown pictorially in Figures 1 through 3, it is evident that the performance at some grades, compared to national norm values, is better than at other grades. The performance of the Mesa students in grades 1, 2, 6, 7, and 9 is exceptional. The performance drops slightly in grades 5 and 8 and the performance in grades 3, 4, 10, 11, and 12 appears to be down from the performance at the other grades. There are some possible explanations for this which should be investigated. At the lower grades, the objectives being measured by the CAT may not map totally with the objectives being delivered in the classroom. This is certainly true in some areas in mathematics where the district feels that the students simply are not mature enough for given concepts and introduces them later. At the higher grades one runs into an artifact of the test in that it seems to top out quickly. A significant number of students, starting at the 10th grade, are scoring exceptionally high and therefore students cluster at this level. Movement of one or two items in a positive or negative direction significantly affects each of the scores presented, i.e., grade equivalent, percentile rank, stanine, and scale scores.

Considering the students' performance over grades by curriculum area there appears to be no dominance among reading, grammar, or mathematics. In 1981 the performance was

extremely close in the three areas. Grammar, however, showed more gain from 1981 to 1982, with math showing the next largest gain and reading the lowest gain. Overall performance summed over grades indicates Mesa students are doing extremely well in all curriculum areas, but a little better in math, with grammar a close second and reading somewhat below the other two areas.

Grades 1 through 6

There are a number of ways to present the information from the California Achievement Test. In the previous section mean or average scores were presented in terms of grade equivalencies, percentile ranks, stanines and scale scores. This method of presentation is appropriate if one is strictly interested in how the average student in the district is achieving. In this section a different approach is taken. The statistic that is investigated is the percent of students scoring at a given level. Three different areas are investigated:

1. The percent of Mesa students that are scoring at or above national norms, where the national norm used is the median score of 50 or the 50th percentile;

2. The percent of students that are scoring in the lowest national quartile, that is, the lowest 25th percent in the nation; and

3. The percent of students scoring in the highest national quartile, i.e., the upper 25% of the nation. Comparisons can be made between each of these district percentage values and the norm group. If the students from the Mesa schools were performing

at norm you would expect 50% of them to be at or above national norms. You would expect 25% to be in the lowest quartile of the national norms and correspondingly 25% in the highest national quartile.

Table 4 presents the percent of Mesa students at or above national norms for the years 1981 and 1982 by subtest. When considering the values presented in Table 4, the norm value used for comparison purposes is 50. It can be seen from Table 4 that the performance of Mesa elementary students has been more than satisfactory over this two year period in all areas and all grades. In fact, the performance at some grades and in given subject levels has been outstanding. The range of the performance for 1982 is from 80% of the students in the first grade scoring at or above national norms in Phonic Analysis to a low of 59% of the students in the third grade scoring at or above national norms in Total Math. It can also be seen in Table 4 that the performance of the Mesa students increased in all areas from 1981 to 1982 with the exception of Phonics in the third grade where 73% were at or above national norms in 1981. This figure dropped, but was still a high 72%.

If the information in Table 4 is considered over grades for those subjects that were administered at all grades, the performance of the Mesa students remains extremely high. It should be noted that the performance in two areas is relatively high but appears low when compared to the students' performance in the other subtests. These areas are Reading Comprehension and Math Concepts and Applications.

Table 4

Percent of Mesa Students at or Above National Norms*

Grade	Year	Subtest/Subject										
		Phonics Analysis	Structural Analysis	Reading Voc.	Reading Comp.	Total Reading	Grammar Mech.	Grammar Expr.	Total Grammar	Math Comp.	Math Concepts App.	Total Math
1	1981	79	NA	73	69	76	NA	67	NA	67	71	72
	1982	80	NA	74	70	78	NA	70	NA	74	74	76
2	1981	70	65	58	59	65	68	64	63	59	60	62
	1982	72	72	63	62	70	78	69	72	70	66	70
3	1981	73	75	61	59	66	69	59	64	56	60	57
	1982	72	76	64	60	67	75	61	68	62	61	63
4	1981	NA	NA	63	61	63	67	59	64	54	56	54
	1982	NA	NA	67	63	66	70	61	67	61	61	60
5	1981	NA	NA	65	63	65	70	67	68	64	53	58
	1982	NA	NA	67	64	67	74	69	71	67	59	63
6	1981	NA	NA	63	70	66	73	66	68	71	62	69
	1982	NA	NA	65	68	67	77	67	72	75	65	71

*Nation norm percentile used was the median score of 50.

Considering the students' performance by grade over subtests or subjects, the performance varies somewhat by grade. The performance is high at all grades but is somewhat higher at grades 1 and 6. Two grades that are relatively lower than the other grades are 3 and 4.

Table 5 presents the percent of Mesa students in the lowest national quartile. The comparison norm value would be 25%. Any value lower than 25% indicates that the performance of Mesa students is such that few are found in the low range compared to national norms. From Table 5 it can be seen that based on the low end of the performance spectrum Mesa students again perform extremely well. Considering information from 1982, only one area showed 20% of the students in the lowest quartile, that being Grammar Expression. There were three areas that had 16% compared to the national norm value of 25%. They were Math Computation in the 4th grade, Math Concepts and Applications in the 3rd grade and Total Math in the 4th grade. The best performance area was found to be Phonics Analysis at the 2nd grade where only 6.1% of the students were found in the lowest quartile. Gains were found in most areas from 1981 to 1982; that is, a decrease in the percent of students in the lowest quartile. In only two areas was there an increase: Phonic Analysis in grade 3 which rose a negligible 8.0 to 8.2 and Reading Vocabulary at the 6th grade which increased from 10.0 to 11.0.

Table 5

Percent of Mesa Students in Lowest National Quartile

Grade	Year	Subtest/Subject										
		Phonics Analysis	Structural Analysis	Reading Voc.	Reading Comp.	Total Reading	Grammar Mech.	Grammar Expr.	Total Grammar	Math Comp.	Math Concepts App.	Total Math
1	1981	7.7	NA	12.0	11.0	7.8	NA	22.0	NA	13.0	10.0	10.0
	1982	7.2	NA	9.5	8.8	7.0	NA	20.0	NA	11.0	8.7	7.9
2	1981	7.3	12.0	14.0	14.0	12.0	10.3	14.0	13.0	14.0	15.0	13.0
	1982	6.1	10.0	10.0	11.0	9.5	7.7	11.0	9.5	8.3	12.0	8.8
3	1981	8.0	8.3	16.0	16.0	13.0	14.0	15.0	14.0	18.0	18.0	18.0
	1982	8.2	8.2	15.0	15.0	13.0	11.0	15.0	12.0	15.0	16.0	15.0
4	1981	NA	NA	11.0	16.0	14.0	14.0	13.0	13.0	20.0	17.0	18.0
	1982	NA	NA	11.0	15.0	13.0	12.0	12.0	11.0	16.0	15.0	16.0
5	1981	NA	NA	11.0	15.0	13.0	13.0	13.0	12.0	15.0	17.0	16.0
	1982	NA	NA	11.0	15.0	13.0	12.0	12.0	11.0	14.0	15.0	14.0
6	1981	NA	NA	10.0	12.0	11.0	9.7	9.0	10.0	11.0	13.0	10.0
	1982	NA	NA	11.0	12.0	9.3	7.7	8.6	8.1	8.0	12.0	8.4

Table 6 presents the percent of Mesa students in the highest national quartile (25%) and shows a high proportion of the Mesa students in the upper quartile. Considering 1982 performance, it can be seen from Table 6 that a high proportion of the Mesa students are in the upper quartile. At two levels, Phonic Analysis for grade 1 and Grammar Mechanics at grade 2, there were 49% of Mesa students scoring in the upper quartile. There were 48% of the Mesa students in the 6th grade scoring in the upper quartile in Math Computations and 47% at the first grade. There were some areas where the students' performance was such that the percent in the upper quartile was significantly lower. These areas were third grade Reading Vocabulary, Reading Comprehension and Grammar Expression, all of which had 24% of the students, which is below the norm of 25%. Twenty-seven percent of the Mesa students were in the upper quartile in 6th grade Reading Vocabulary and 4th grade Math Concepts and Applications. Student performance decreased in only two areas from 1981 to 1982 and these were 1% decreases in Reading Vocabulary at the first grade and Reading Comprehension in the sixth grade.

Figures 4 through 14 present mean scale scores for the performance of Mesa students in 1981 and 1982 with corresponding scores for the state and the nation by subtest or subject area. Uniformly over subtest area it can be seen that the performance of Mesa students far surpasses that of national norms and of the state. In addition, the performance of Mesa students in 1981-82 in almost all cases is higher than the performance of Mesa

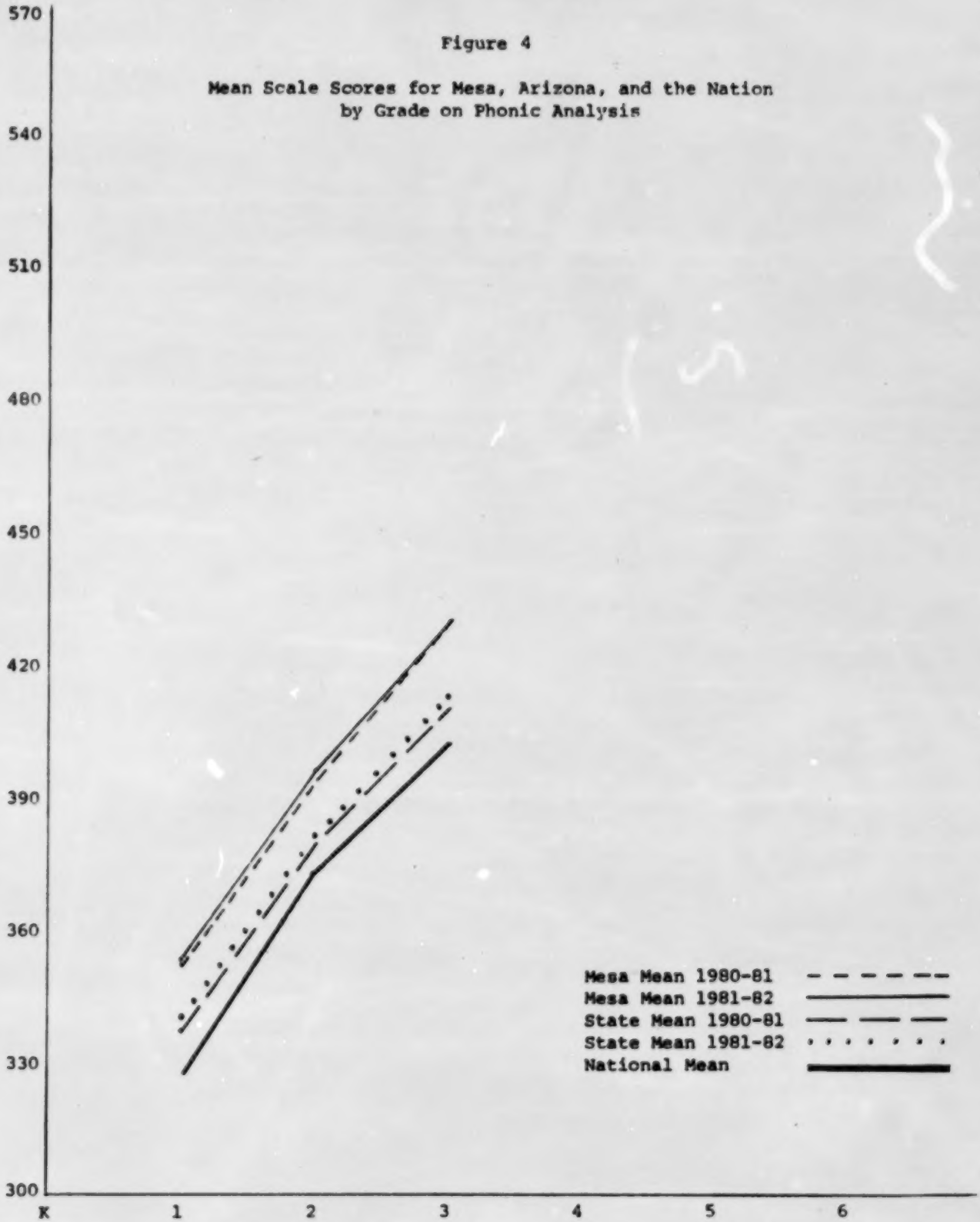
Table 6

Percent of Mesa Students in Highest National Quartile

Grade	Year	Subtest/Subject										
		Phonics Analysis	Structural Analysis	Reading Voc.	Reading Comp.	Total Reading	Grammar Mech.	Grammar Expr.	Total Grammar	Math Comp.	Math Concepts App.	Total Math
1	1981	48	NA	45	40	41	NA	41	NA	31	40	40
	1982	49	NA	44	42	42	NA	43	NA	38	44	47
2	1981	40	33	34	28	36	37	30	35	28	28	27
	1982	40	40	39	30	38	49	35	44	36	36	35
3	1981	42	39	24	23	38	37	22	35	26	27	25
	1982	42	42	24	24	39	44	24	40	33	31	31
4	1981	NA	NA	30	30	27	37	33	35	28	22	27
	1982	NA	NA	33	32	29	43	35	39	36	27	34
5	1981	NA	NA	33	36	34	42	40	37	34	24	28
	1982	NA	NA	37	37	38	50	46	45	40	30	36
6	1981	NA	NA	25	36	32	36	36	36	45	33	41
	1982	NA	NA	27	35	32	40	38	39	48	35	44

Figure 4

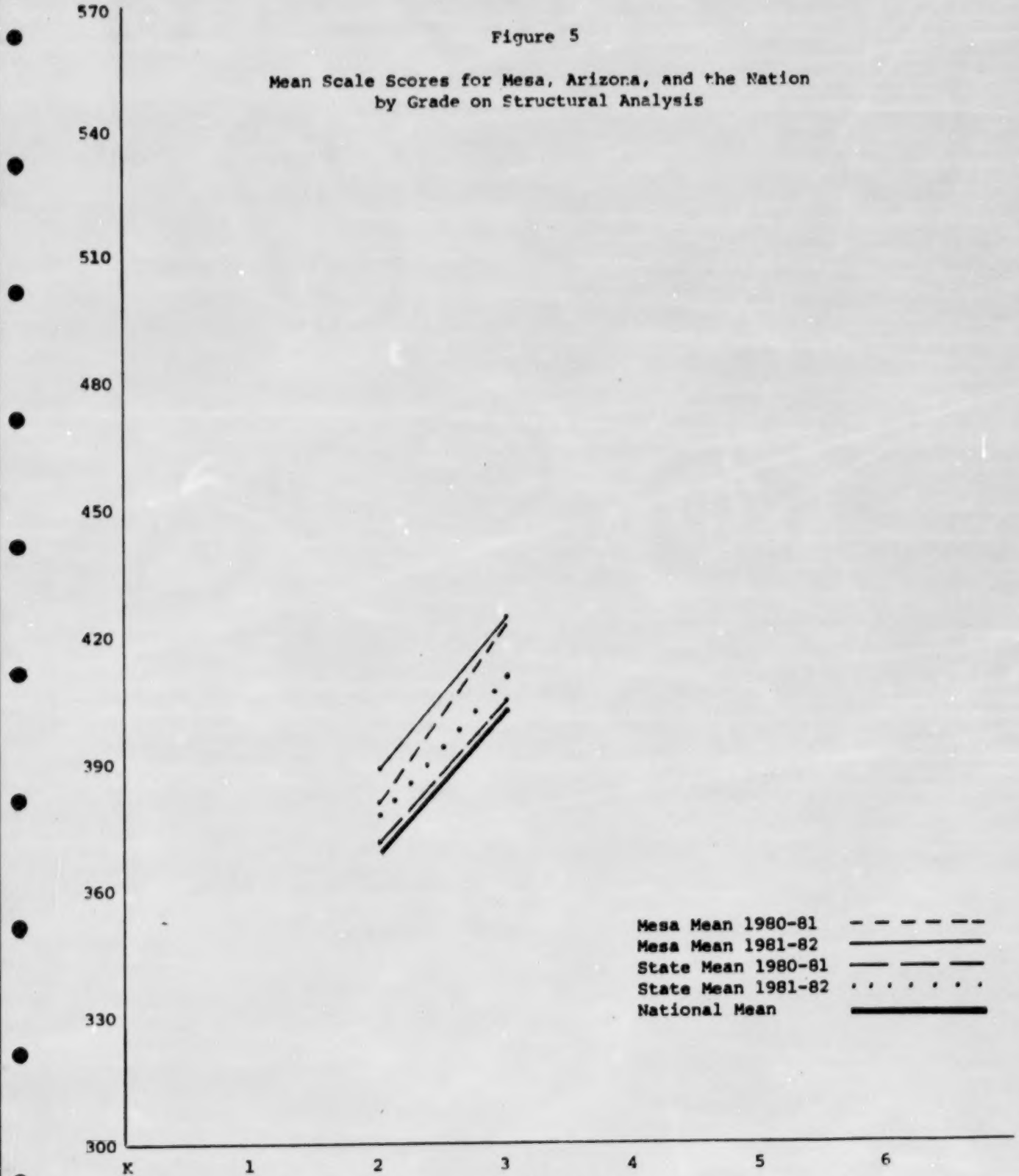
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Phonic Analysis



	K	1	2	3	4	5	6
Mesa Mean 1980-81		352	394	430			
Mesa Mean 1981-82		353	396	430			
State Mean 1980-81		337	380	411			
State Mean 1981-82		340	381	413			
National Mean		327	373	402			

Figure 5

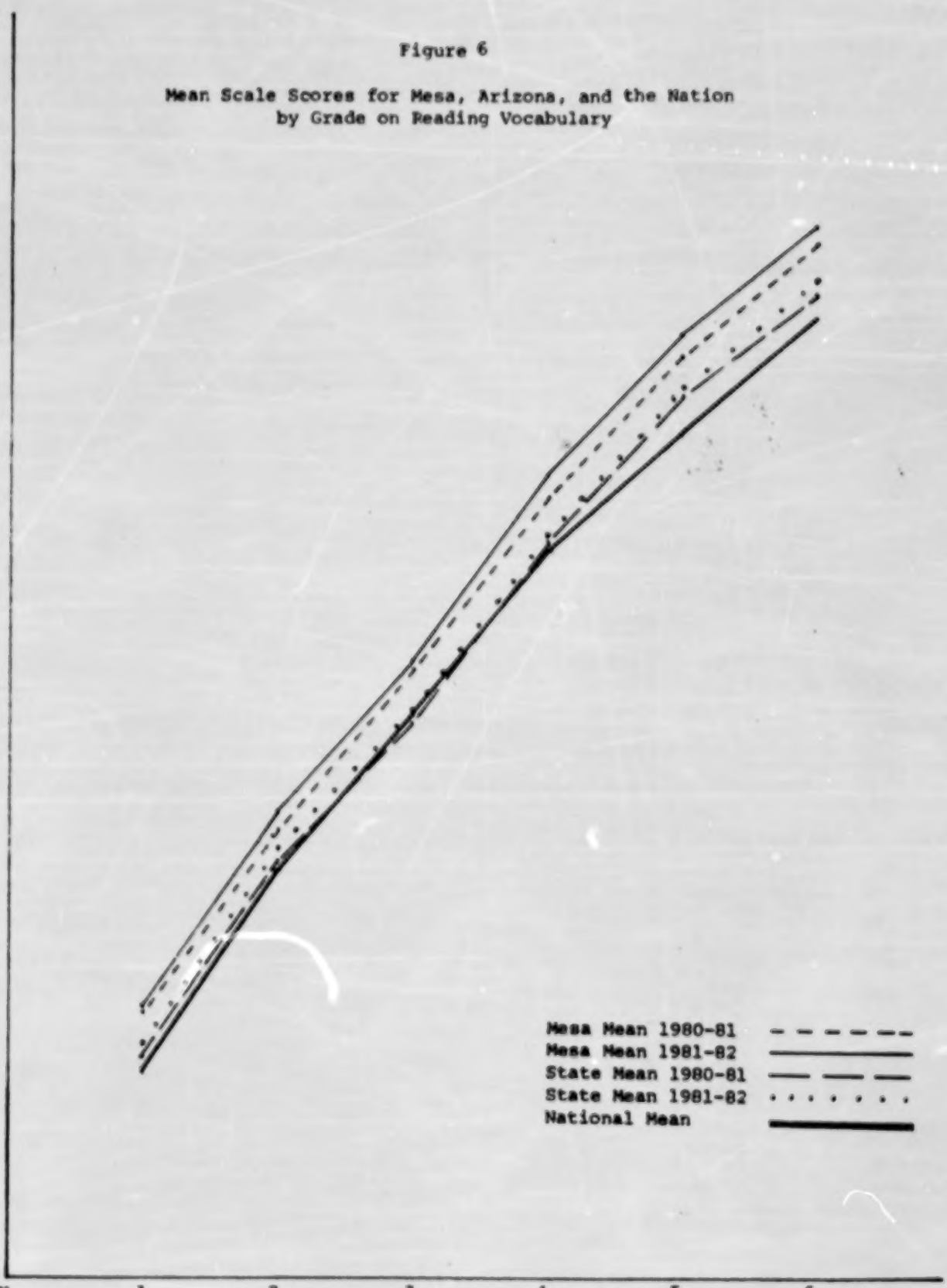
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Structural Analysis



Mesa Mean 1980-81	381	423
Mesa Mean 1981-82	389	425
State Mean 1980-81	372	405
State Mean 1981-82	378	411
National Mean	369	403

Figure 6

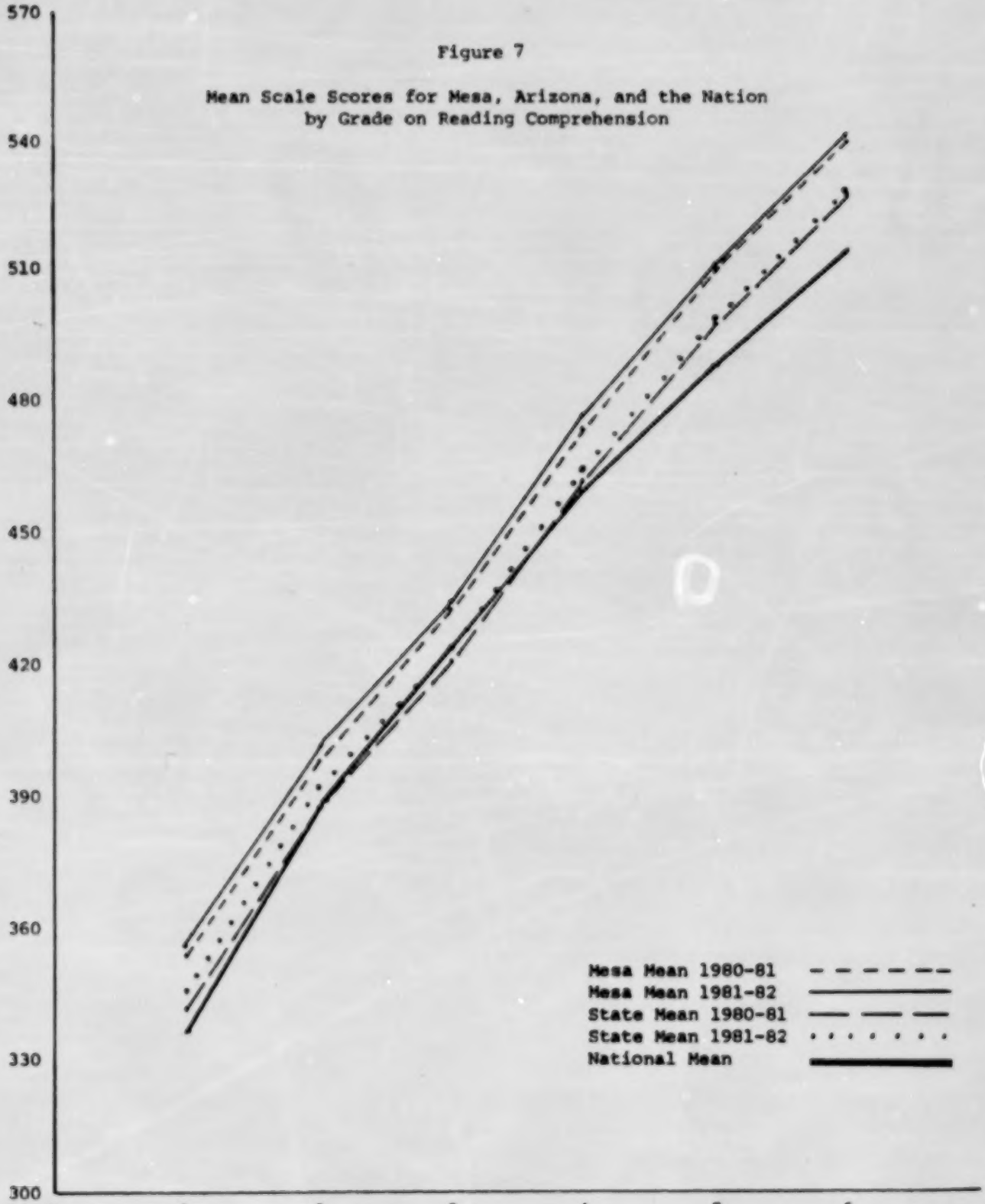
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Reading Vocabulary



	K	1	2	3	4	5	6
Mesa Mean 1980-81		345	386	422	461	493	518
Mesa Mean 1981-82		346	390	424	466	498	522
State Mean 1980-81		335	379	410	451	484	507
State Mean 1981-82		337	382	413	452	486	510
National Mean		331	377	412	449	475	501

Figure 7

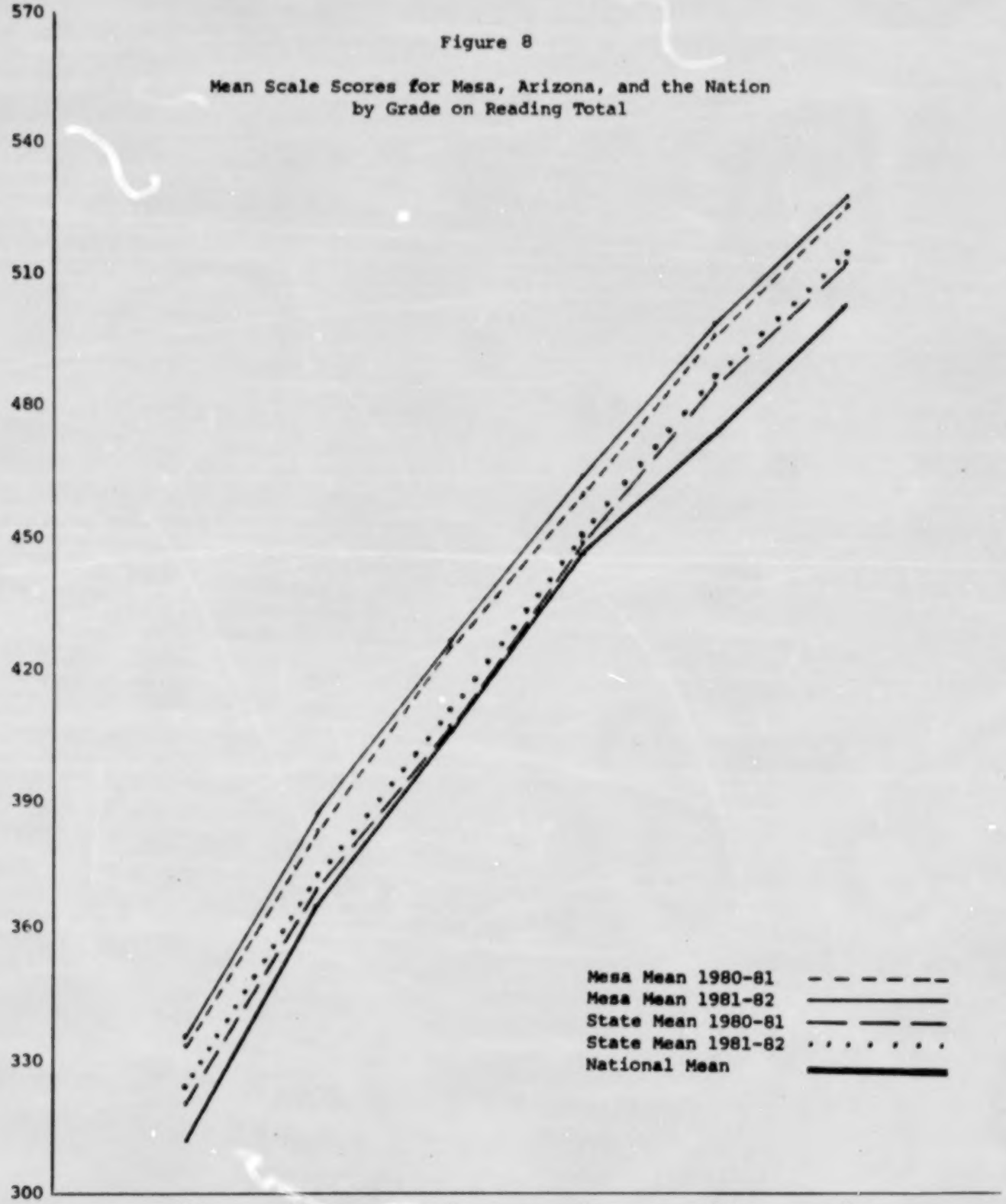
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Reading Comprehension



	K	1	2	3	4	5	6
Mesa Mean 1980-81		354	398	433	474	510	539
Mesa Mean 1981-82		356	402	434	477	511	540
State Mean 1980-81		342	388	421	462	498	527
State Mean 1981-82		346	392	424	465	499	528
National Mean		336	388	424	460	488	514

Figure 8

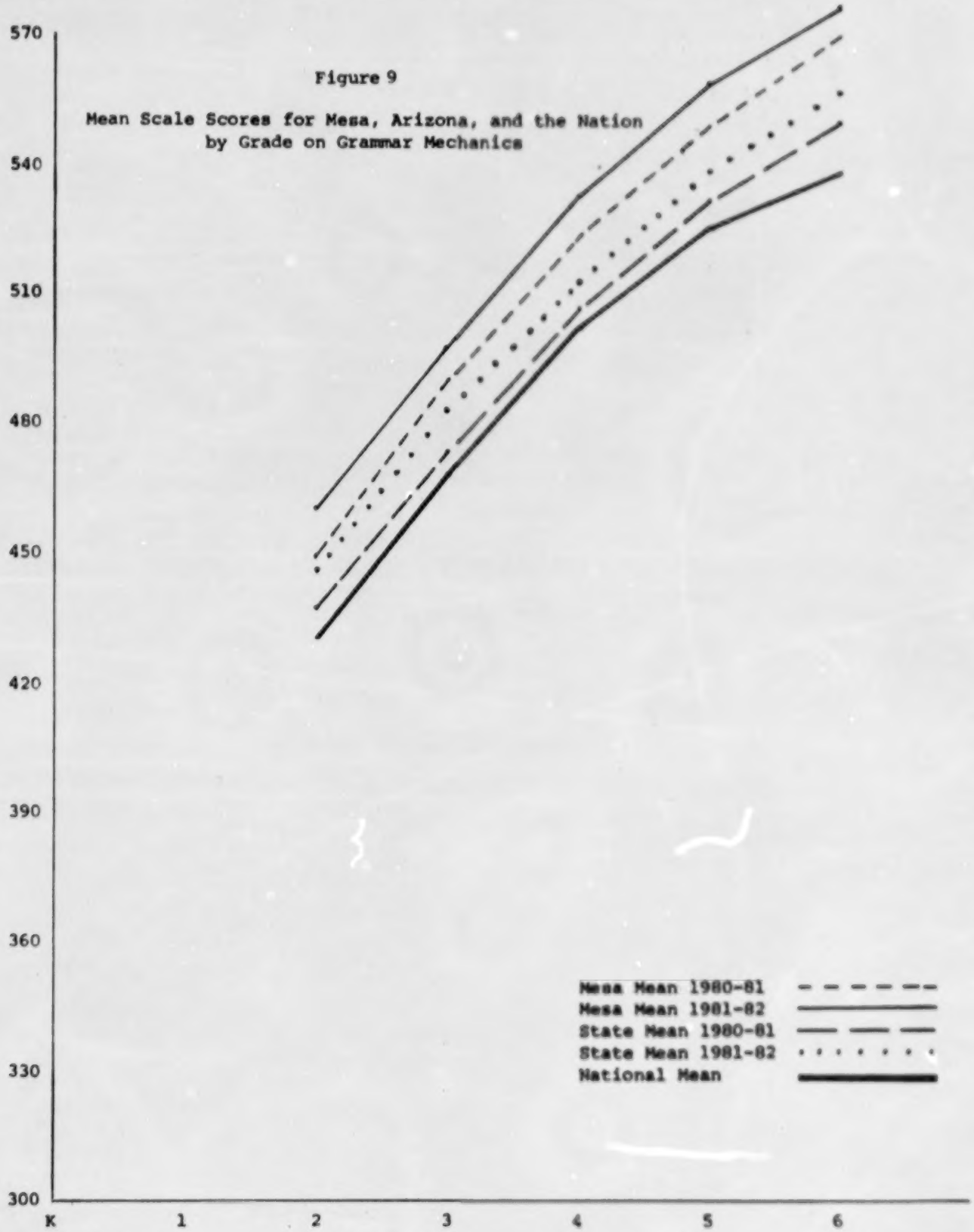
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Reading Total



	K	1	2	3	4	5	6
Mesa Mean 1980-81		334	383	425	460	496	526
Mesa Mean 1981-82		336	387	426	464	499	528
State Mean 1980-81		321	370	407	449	485	513
State Mean 1981-82		324	374	411	451	487	515
National Mean		312	366	406	446	474	503

Figure 9

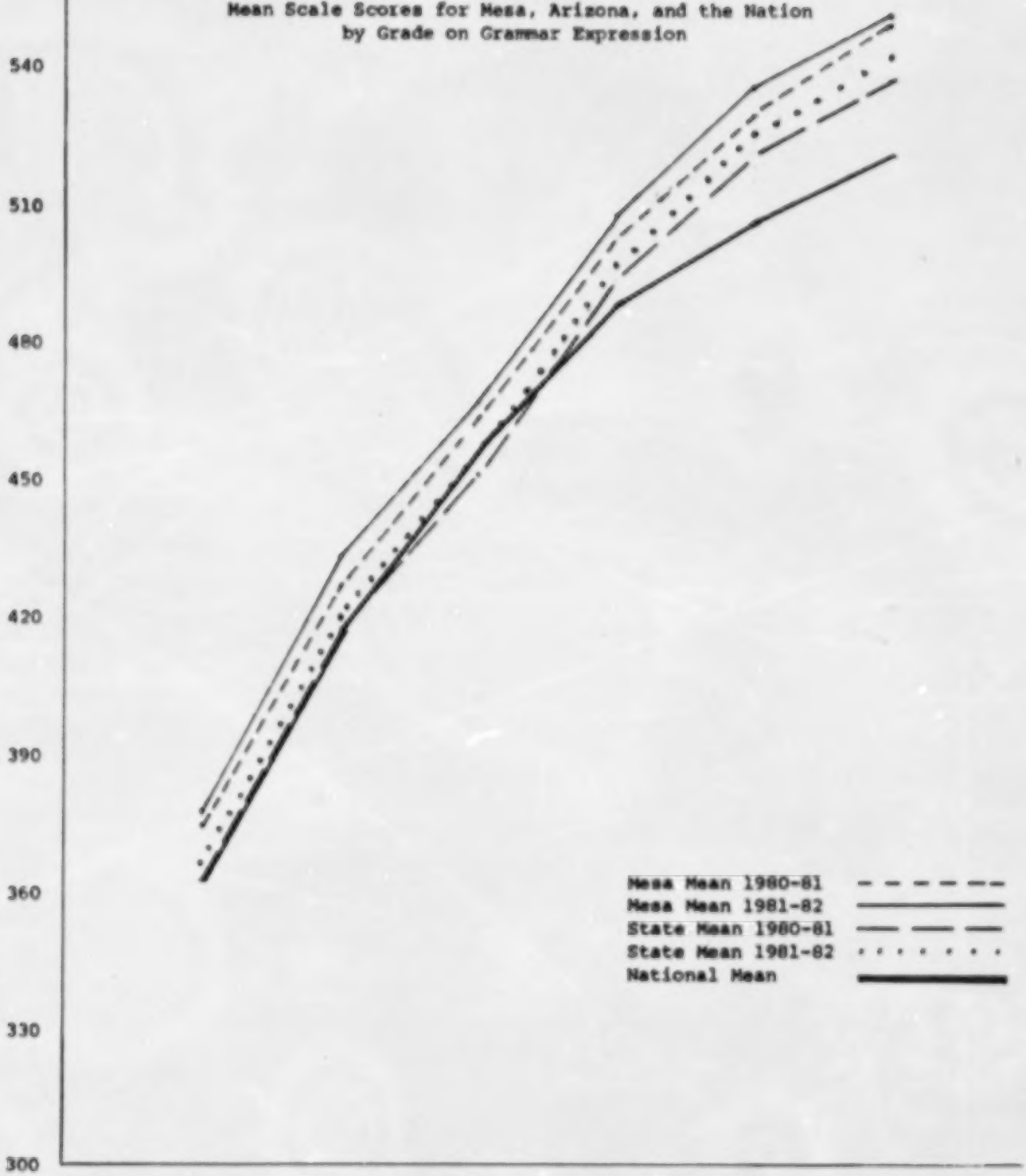
Mean Scale Scores for Mesa, Arizona, and the Nation by Grade on Grammar Mechanics



	K	1	2	3	4	5	6
Mesa Mean 1980-81			449	490	523	548	569
Mesa Mean 1981-82			460	497	532	558	576
State Mean 1980-81			437	473	506	531	549
State Mean 1981-82			446	483	512	538	556
National Mean			430	468	501	523	537

Figure 10

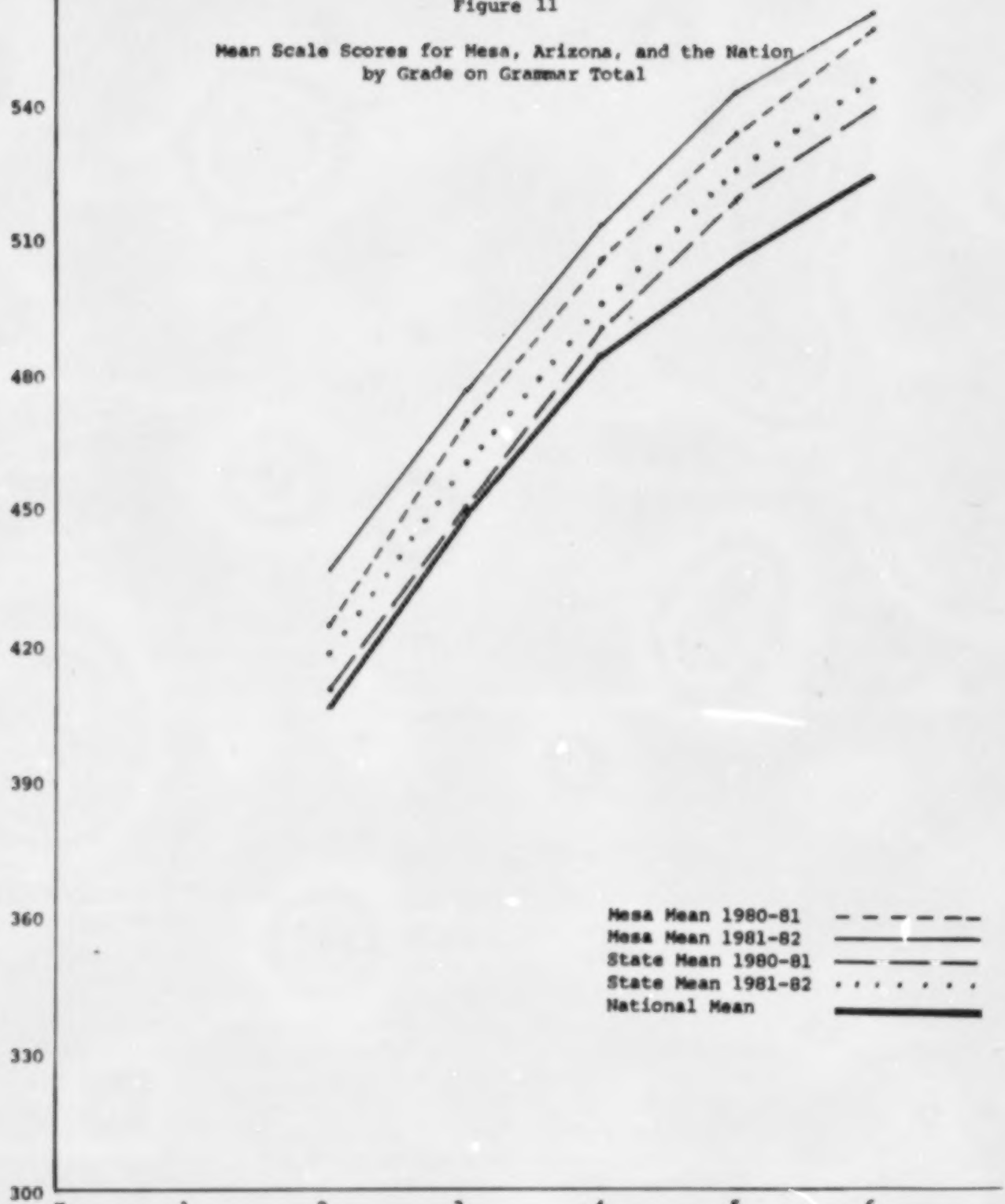
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Grammar Expression



	K	1	2	3	4	5	6
Mesa Mean 1980-81		374	427	464	503	530	550
Mesa Mean 1981-82		377	433	467	508	536	552
State Mean 1980-81		362	417	451	494	522	538
State Mean 1981-82		366	420	456	497	526	543
National Mean		362	417	456	488	506	521

Figure 11

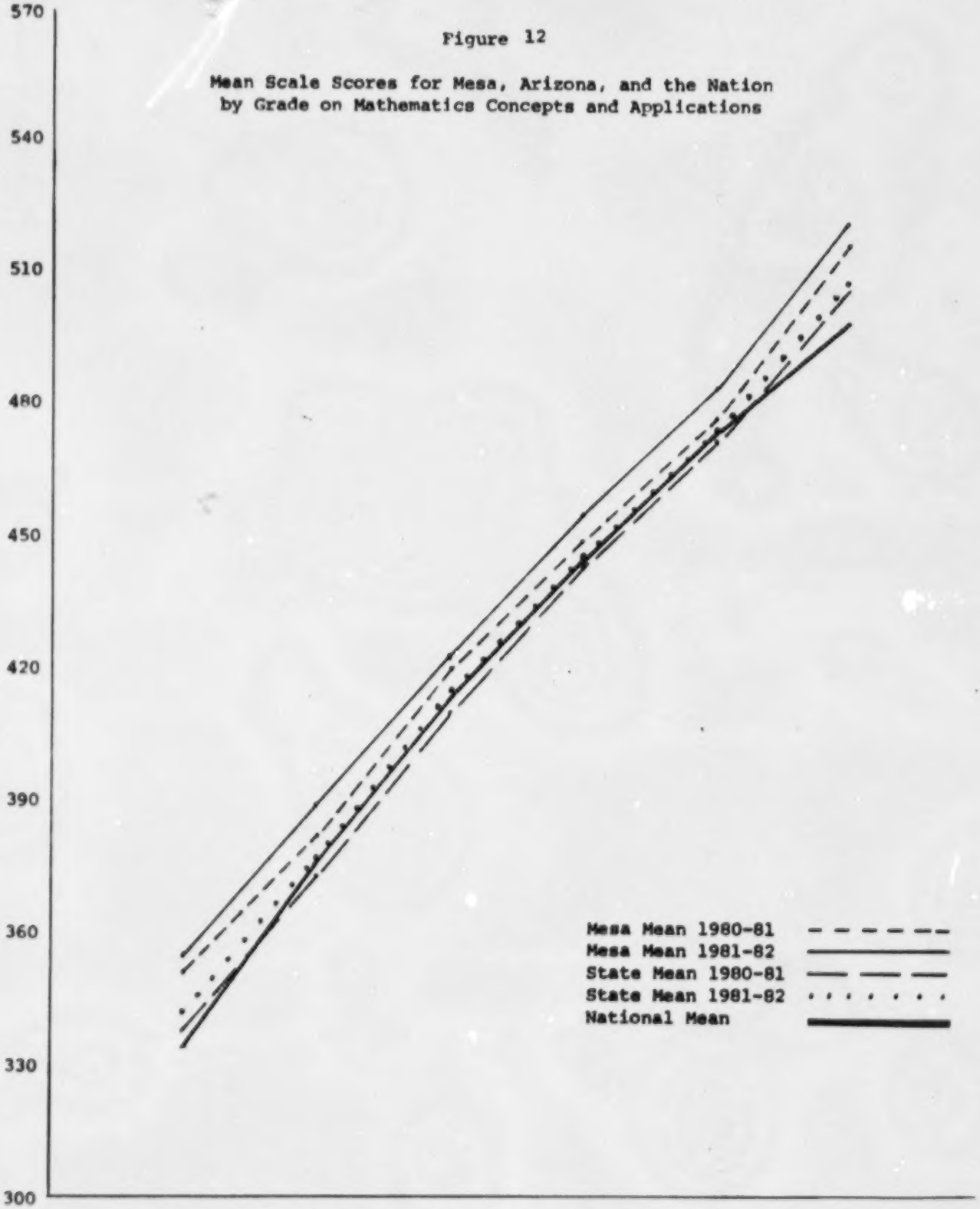
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Grammar Total



	K	1	2	3	4	5	6
Mesa Mean 1980-81			425	470	506	534	557
Mesa Mean 1981-82			437	477	514	543	561
State Mean 1980-81			411	451	491	520	540
State Mean 1981-82			419	461	496	526	546
National Mean			406	450	485	506	523

Figure 12

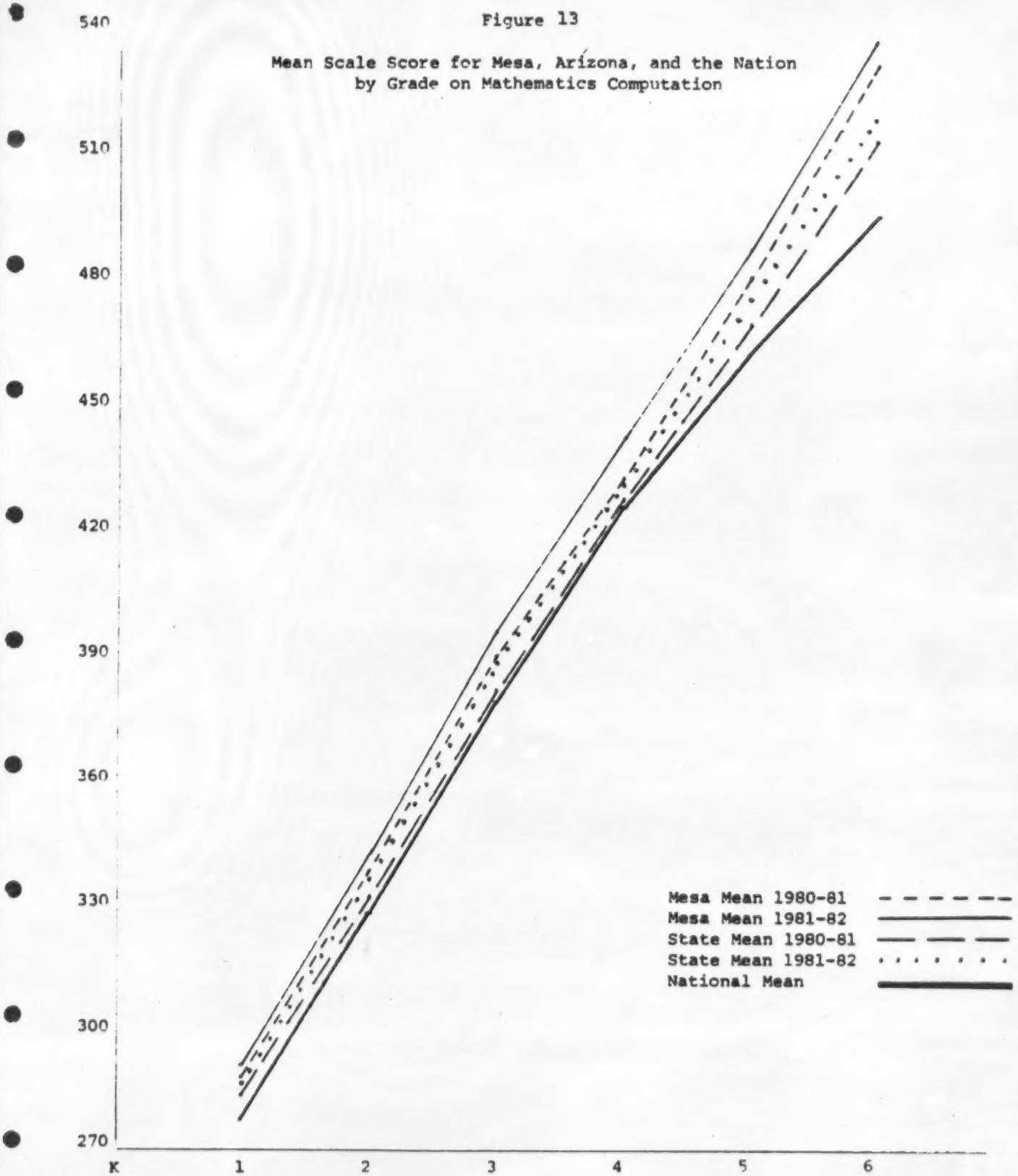
Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Mathematics Concepts and Applications



	K	1	2	3	4	5	6
Mesa Mean 1980-81		351	382	420	449	477	516
Mesa Mean 1981-82		355	389	423	455	484	521
State Mean 1980-81		338	373	410	443	472	506
State Mean 1981-82		342	379	415	446	475	508
National Mean		334	376	413	444	473	499

Figure 13

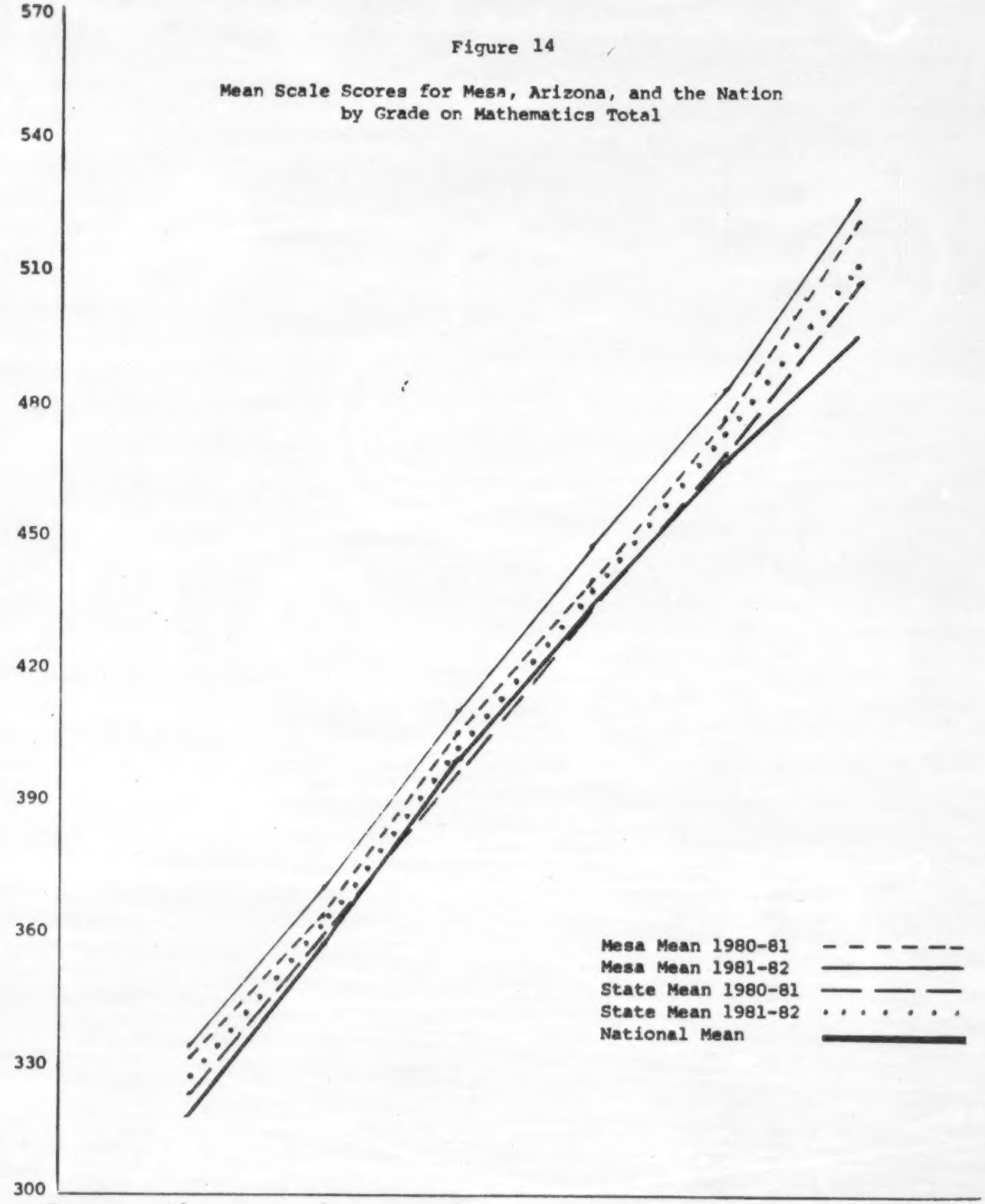
Mean Scale Score for Mesa, Arizona, and the Nation
by Grade on Mathematics Computation



	K	1	2	3	4	5	6
Mesa Mean 1980-81		286	335	389	432	480	531
Mesa Mean 1981-82		290	342	395	442	487	537
State Mean 1980-81		283	331	381	427	469	513
State Mean 1981-82		287	337	388	431	475	518
National Mean		276	327	384	425	462	495

Figure 14

Mean Scale Scores for Mesa, Arizona, and the Nation
by Grade on Mathematics Total

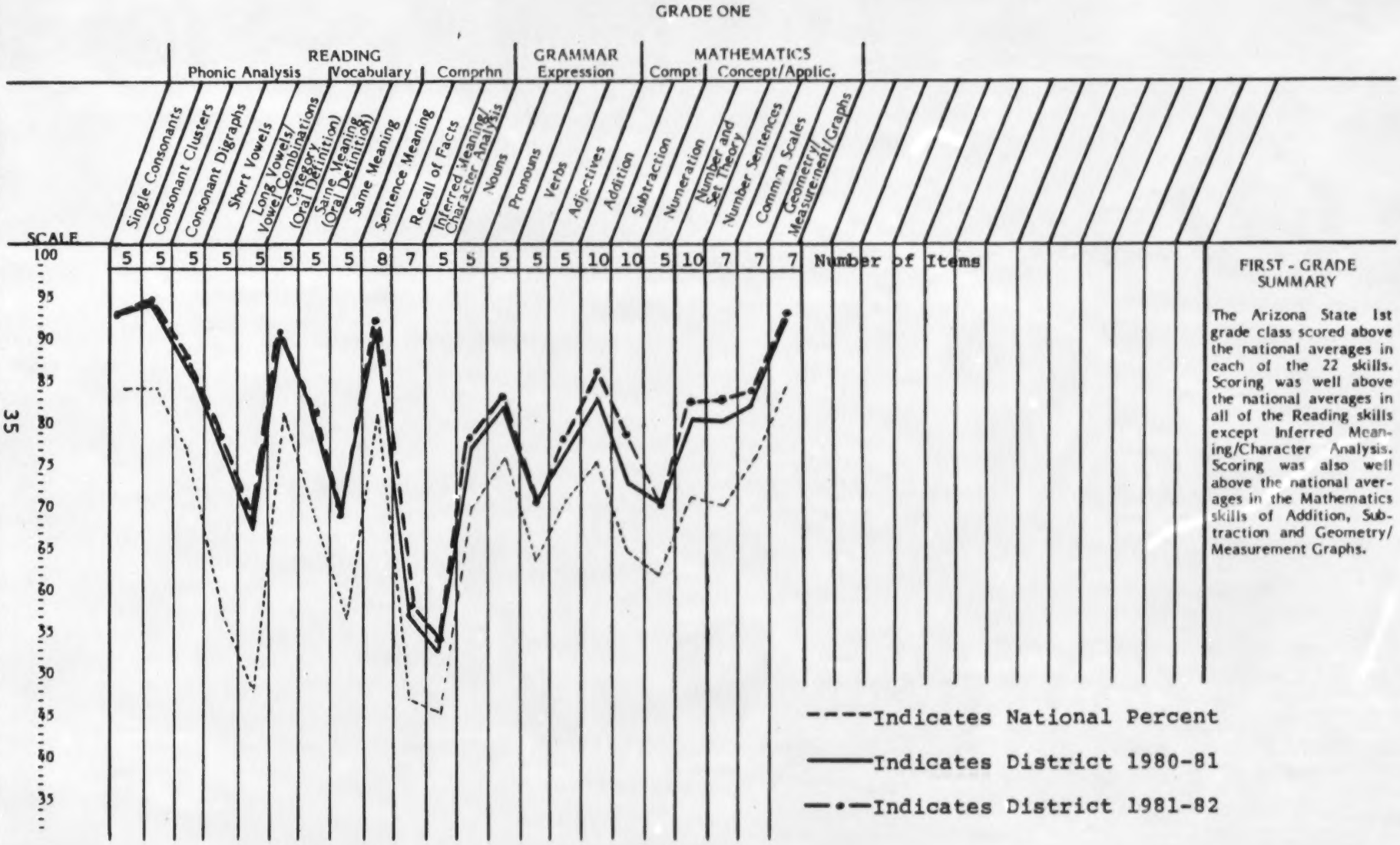


	K	1	2	3	4	5	6
Mesa Mean 1980-81		331	364	405	440	477	522
Mesa Mean 1981-82		334	370	410	448	484	527
State Mean 1980-81		323	359	397	434	469	508
State Mean 1981-82		327	364	402	438	474	512
National Mean		318	357	399	434	467	496

students in 1980-81. Not uniformly so, but for a number of the subtests it is also apparent that the Mesa students seem to perform much better compared to national norms at the first and second grade and then have somewhat decreased performance in the third and fourth grades. The fifth and sixth grades in turn again show significantly better performance than national norms. There are some deviations from this such as Grammar Expression where the fourth grade students begin to pull away from national norms. And in the opposite direction, the fifth grade students' performance in Mathematics Concepts and Applications is not quite as good as the performance of sixth graders or of first and second graders.

Skill Areas

As outlined in the description section of this report the California Achievement Test is divided into three major categories with a number of subtests under each category. These subtest areas are then divided into skill areas. The performance of the Mesa elementary students by skill area for each grade is presented in Figures 15-20. The scale used is the percent correct. The range of the number of items per skill area is from 4 to 20. The majority of skill areas are measured with less than 10 items. Each figure presents a performance of the norm group and the performance of the Mesa students for 1980-81 and 1981-82.



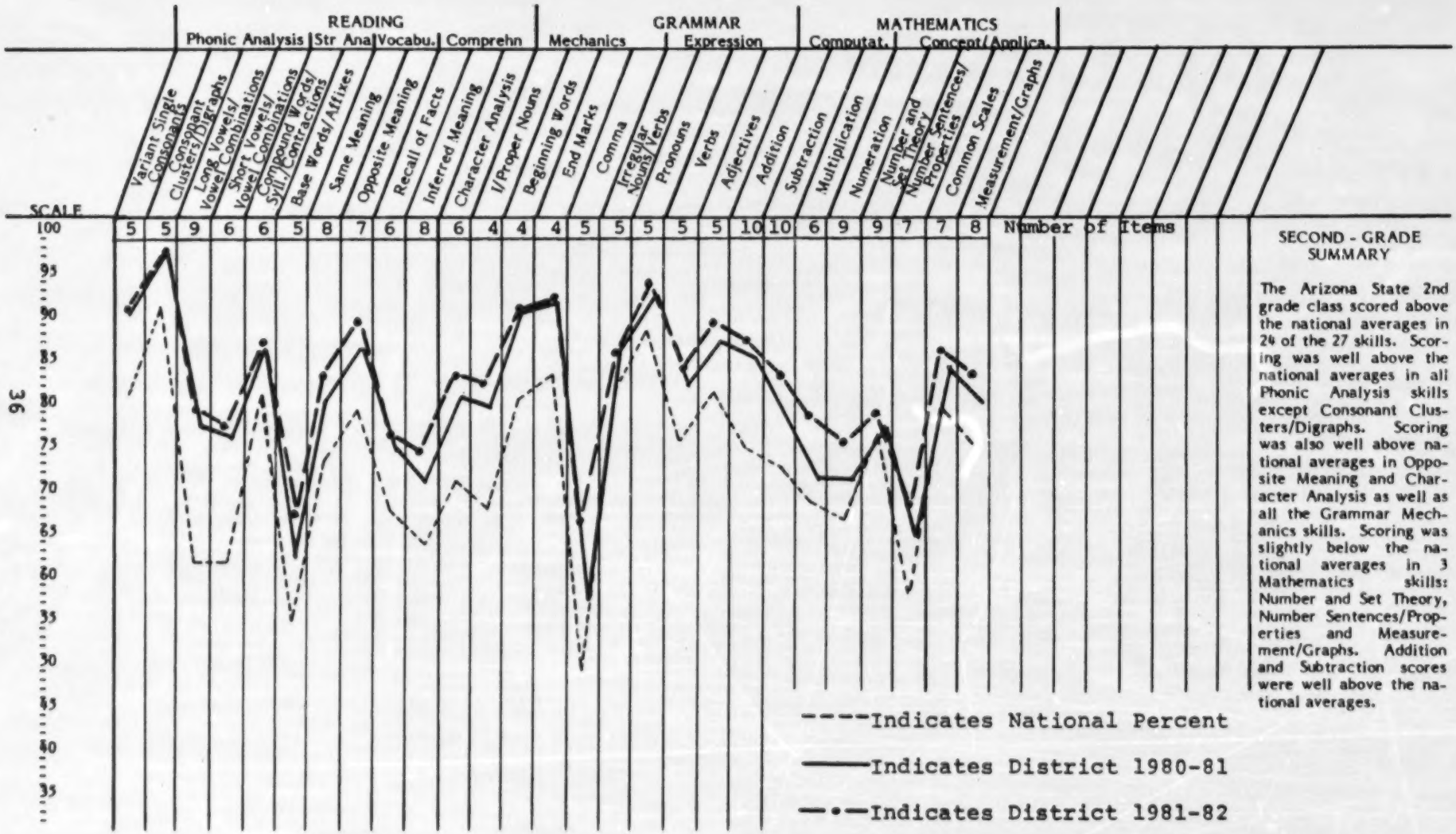
FIRST - GRADE SUMMARY

The Arizona State 1st grade class scored above the national averages in each of the 22 skills. Scoring was well above the national averages in all of the Reading skills except Inferred Meaning/Character Analysis. Scoring was also well above the national averages in the Mathematics skills of Addition, Subtraction and Geometry/ Measurement Graphs.

Figure 15

Percent Correct by Subskill

GRADE TWO

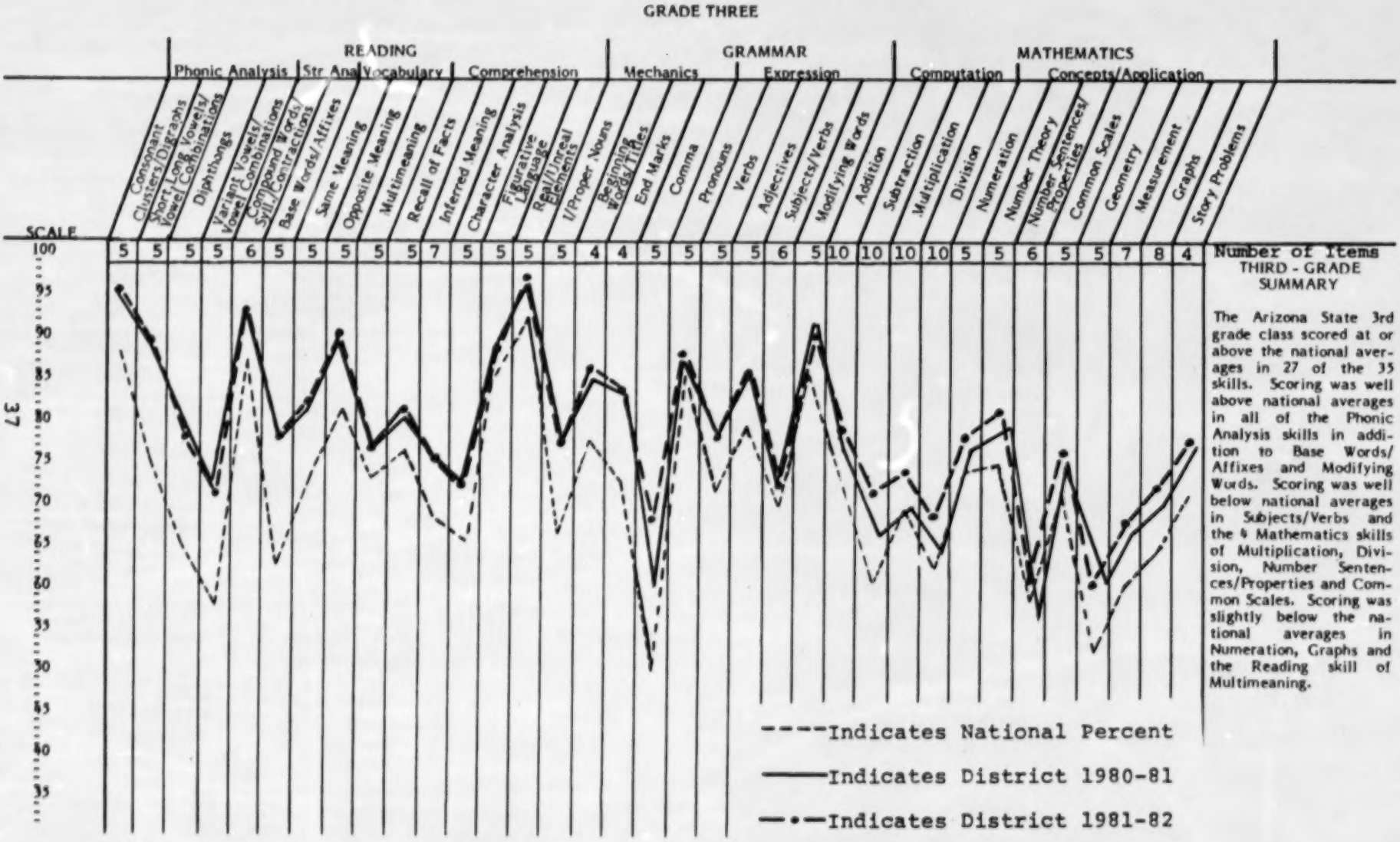


SECOND - GRADE SUMMARY

The Arizona State 2nd grade class scored above the national averages in 24 of the 27 skills. Scoring was well above the national averages in all Phonic Analysis skills except Consonant Clusters/Digraphs. Scoring was also well above national averages in Opposite Meaning and Character Analysis as well as all the Grammar Mechanics skills. Scoring was slightly below the national averages in 3 Mathematics skills: Number and Set Theory, Number Sentences/Properties and Measurement/Graphs. Addition and Subtraction scores were well above the national averages.

Figure 16

Percent Correct by Subskill



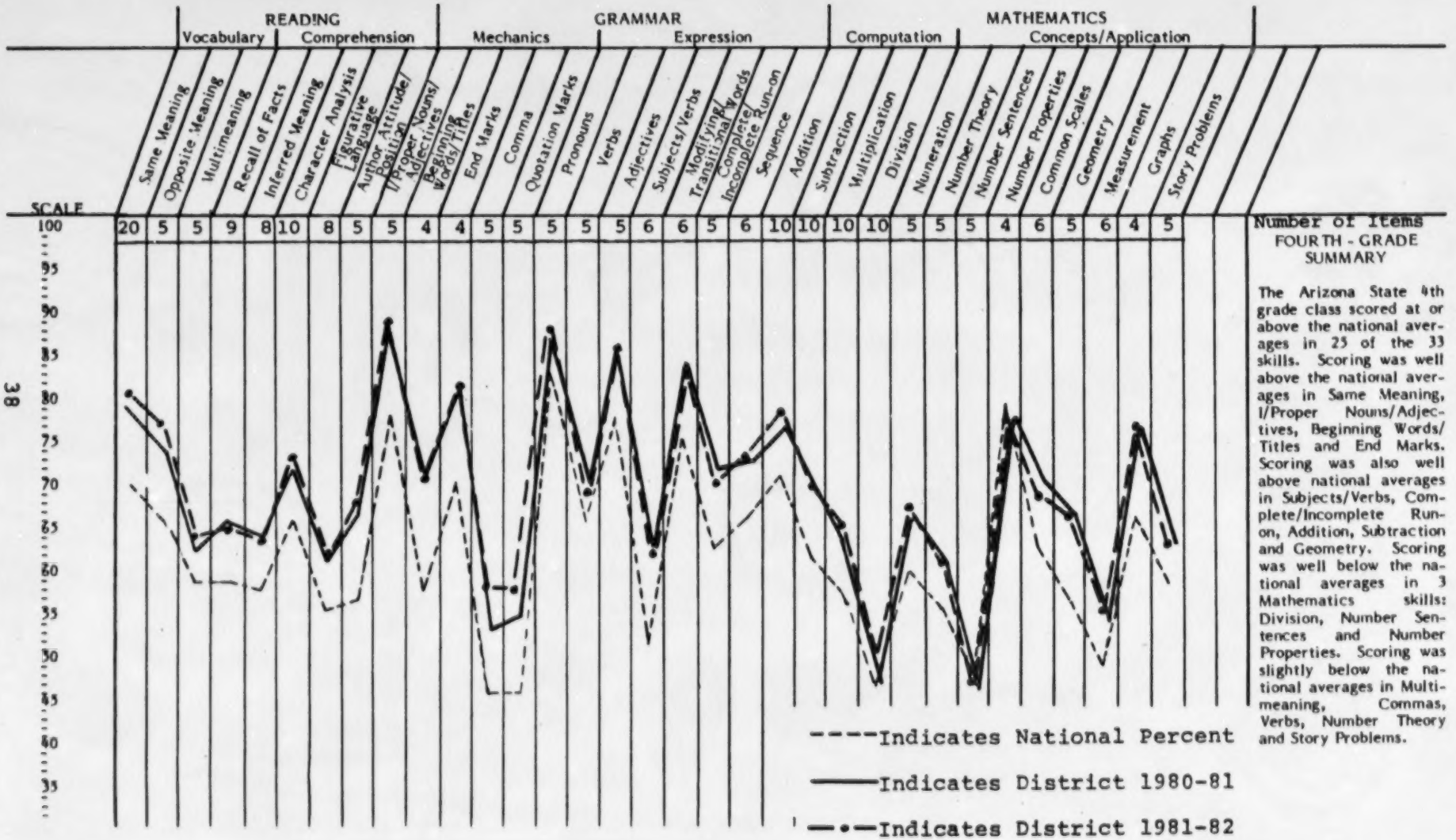
THIRD - GRADE SUMMARY

The Arizona State 3rd grade class scored at or above the national averages in 27 of the 35 skills. Scoring was well above national averages in all of the Phonic Analysis skills in addition to Base Words/ Affixes and Modifying Words. Scoring was well below national averages in Subjects/Verbs and the 4 Mathematics skills of Multiplication, Division, Number Sentences/Properties and Common Scales. Scoring was slightly below the national averages in Numeration, Graphs and the Reading skill of Multimeaning.

Figure 17

Percent Correct by Subskill

GRADE FOUR



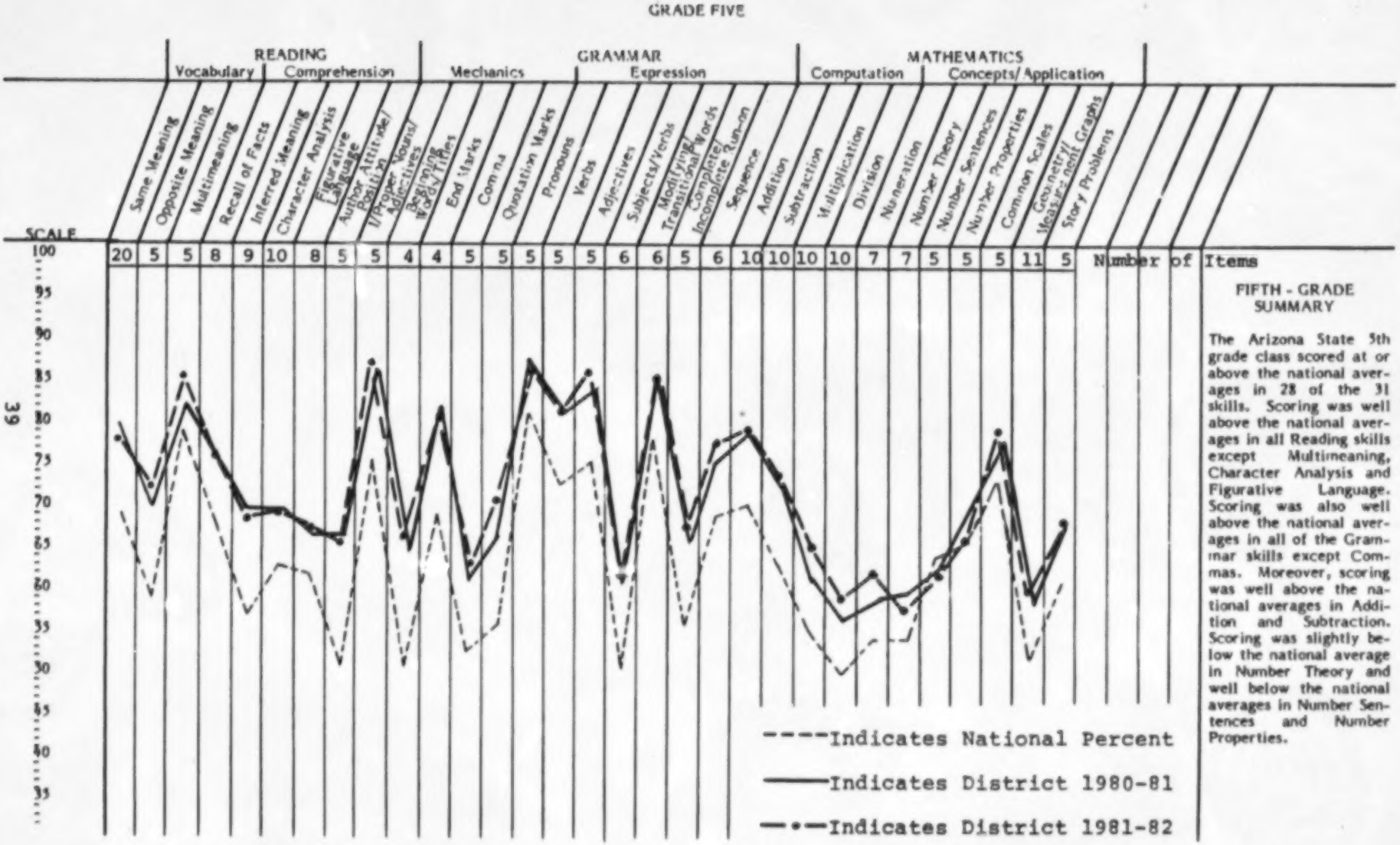
Number of Items

FOURTH - GRADE SUMMARY

The Arizona State 4th grade class scored at or above the national averages in 25 of the 33 skills. Scoring was well above the national averages in Same Meaning, I/Proper Nouns/Adjectives, Beginning Words/Titles and End Marks. Scoring was also well above national averages in Subjects/Verbs, Complete/Incomplete Run-on, Addition, Subtraction and Geometry. Scoring was well below the national averages in 3 Mathematics skills: Division, Number Sentences and Number Properties. Scoring was slightly below the national averages in Multimeaning, Commas, Verbs, Number Theory and Story Problems.

Figure 18

Percent Correct by Subskill



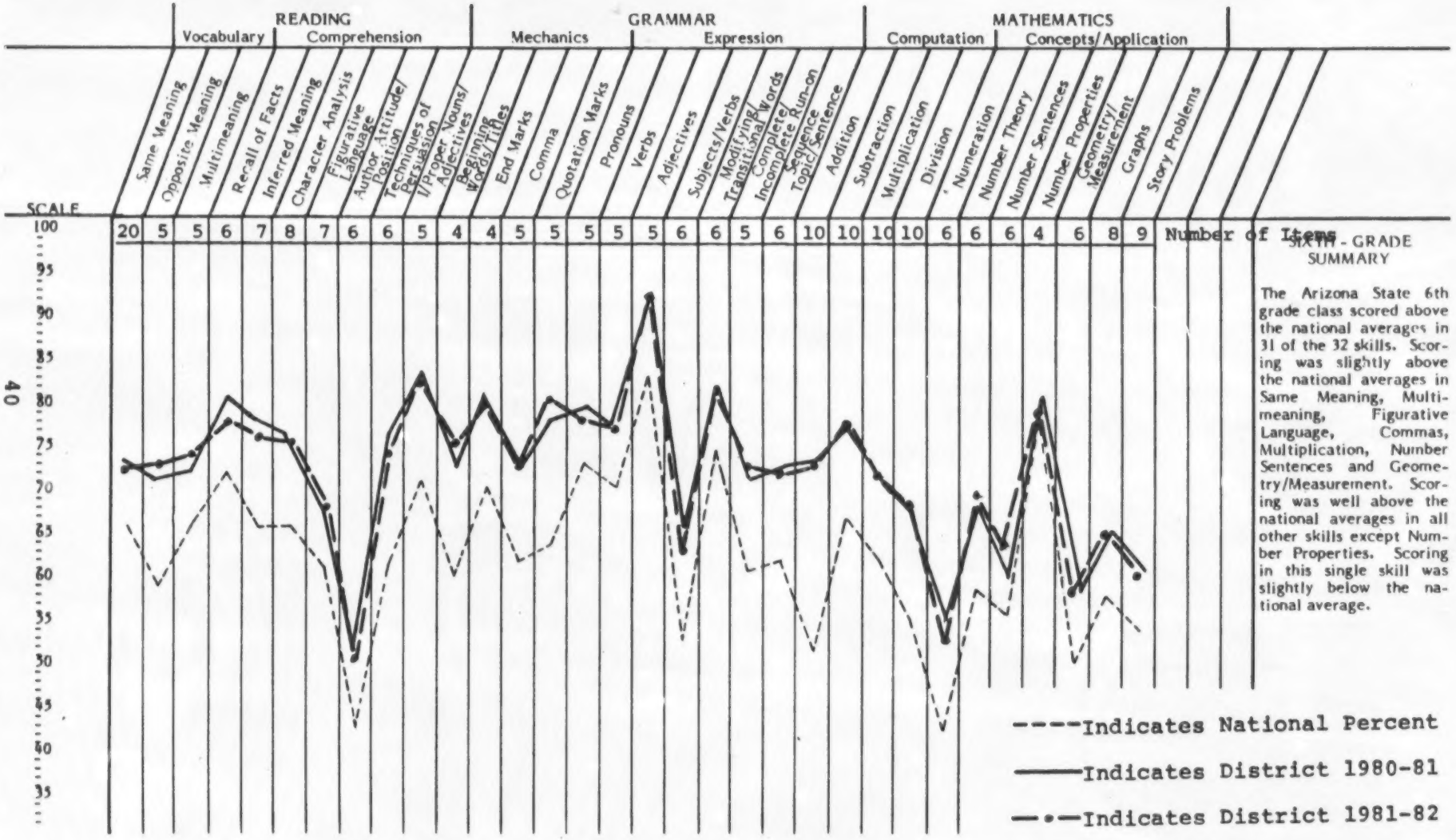
FIFTH - GRADE SUMMARY

The Arizona State 5th grade class scored at or above the national averages in 28 of the 31 skills. Scoring was well above the national averages in all Reading skills except Multimeaning, Character Analysis and Figurative Language. Scoring was also well above the national averages in all of the Grammar skills except Commas. Moreover, scoring was well above the national averages in Addition and Subtraction. Scoring was slightly below the national average in Number Theory and well below the national averages in Number Sentences and Number Properties.

Figure 19

Percent Correct by Subskill

GRADE SIX



SIXTH - GRADE SUMMARY

The Arizona State 6th grade class scored above the national averages in 31 of the 32 skills. Scoring was slightly above the national averages in Same Meaning, Multimeaning, Figurative Language, Commas, Multiplication, Number Sentences and Geometry/Measurement. Scoring was well above the national averages in all other skills except Number Properties. Scoring in this single skill was slightly below the national average.

Figure 20

Percent Correct by Subskill

Each of the Figures, 15 through 20, should be considered independently. It can be seen from these figures Mesa students out perform national norms in almost all subskill areas and the performance in 1981-82 is at or above that of the performance in 1980-81 in most instances. The only subskill areas in which the performance of the norm group was close to that of the students in the Mesa district are the areas under the Concepts or Applications subtests of the overall mathematics tests. In particular, the subskill areas in which the performance of Mesa students is not significantly higher than the norm is Number and Set Theory at the second grade, Number Sentences and Properties, and Common Scales at the third grade, Number Theory, Number Sentences, Number Properties and Common Scales at the fifth grade and Number Properties at the sixth grade.

As with all data there are a number of ways to consider Figures 15 through 20. As noted, one can compare the Mesa student performance to the norm group or to the performance of the previous year. Another way to judge the performance would be to simply establish a given criterion for performance in given skill areas. This is especially true if one is seeking to improve the overall performance of, for example, the first grade students. It can be seen from Figure 15 that Long Vowel and Long Vowel Combinations is a relatively strong area in Mesa compared to the norm group. That is, the average percent correct on the five items measuring Long Vowels for the norm group was 48 percent. The corresponding figure for Mesa students was 68 percent. Even though this figure is significantly

above the national norm there certainly is room for growth. Especially compared to an item such as Sentence Meaning where the average score for the norm groups was 81 percent compared to the average score for Mesa students to the eight items measuring the subskill of 92 percent. Given a 92 percent performance there simply is not much room for growth, even though compared to the norm figure the performance is not as high as that for Long Vowels. Other areas in which some room for growth exists are Recall of Facts and Inferred Meaning and Character Analysis. The performance level of Mesa students in both cases, while significantly above national norms, have percent correct figures of 59 and 54 percent, respectively.

To improve the overall performance of the Mesa students, then it would appear that a given criteria of performance should be selected and strived for, in the case of those items where growth is attainable; that is, those items which the overall performance was not exceptionally high even though it may be significantly above norm values. This performance level should be determined by the basic skills people after examination of the specifics of the skill and curriculum for those given grade levels. If, however, an arbitrary percentage figure of 65 is taken, the following subskill areas have significant room for growth within each grade level:

Grade 1	Recall of Facts, Inferred Meanings/ Character Analysis
Grade 2	--
Grade 3	Number Sentences/Properties, Geometry

Grade 4	Multimeaning, Recall of Facts, Inferred Meanings, Figurative Language, Comma, Quotation Marks, Subject/Verbs, Multiplication, Division, Number Theory, Number Sentences, Measurement, Story Problems
Grade 5	Author Attitude/Position, Comma, Subject/ Verbs, Multiplication, Numeration, Number Theory, Number Sentences, Number Properties, Geometry/Measurement/Graphs, Division
Grade 6	Subject/Verbs, Number Sentences, Geometry/ Measurement, Graphs, Story Problems

Elementary

Table 7 presents the mean scale scores by school for 1981 and 1982 for Total Reading, Math and Grammar. It can be seen from Table 7 that overall the elementary schools in Mesa showed gains in achievement from 1981 to 1982. Considering the 18 areas presented, i.e., grade by curriculum area (6 x 3), increases in overall school means were shown for all 18 areas. In addition, each of the 36 areas, grade by curriculum area by year (6 x 3 x 2), were above national norms. One area, grade 1 for Total Math in 1982, was more than 1 standard deviation above the national norm mean.

There are, however, areas for which improvement can be made. In fact, given 192 (32 schools x 6 grades) opportunities for increase for each curriculum area, there were (decreases are indicated by - in Table 7):

78 decreases in Total Reading

53 decreases in Total Grammar

47 decreases in Total Math

Even comparing the performance of our schools to national norms there is certainly room for growth. Again, with 192 opportunities to be at or above national norms each year within each curriculum

Table 7

California Achievement Test (CAT)
Mean Scale Scores

	Grade 1						Grade 2						Grade 3					
	Total Reading		Total Math		Total Grammar		Total Reading		Total Math		Total Grammar		Total Reading		Total Math		Total Grammar	
School	82	81	82	81	82	81	82	81	82	81	82	81	82	81	82	81	82	81
ADAMS	336	323	329	323	371	358	371	367	364	354	418	408	414	416	399	397	461	453
ALMA	333	336	335	329	378	381	396	396	373	367	453	448	438	442	418	414	487	482
CRISMON	336	331	336	320	373	369	393	391	376	376	440	451	440	432	420	416	496	480
EDISON	339	342	336	342	387	376	389	392	374	384	439	446	418	426	411	410	461	455
EISENHOWER	313	312	327	324	349	357	357	361	356	353	407	393	410	399	402	391	470	444
EMERSON	344	346	343	335	390	392	406	393	383	376	462	440	433	433	414	403	481	472
FIELD	338	337	337	330	373	373	397	393	366	373	431	435	446	433	415	413	492	477
FRANKLIN	358	354	352	345	403	392	439	421	401	389	491	479	459	436	439	429	510	502
HALE	355	347	336	340	403	397	406	397	387	375	465	448	451	444	436	425	511	511
HAWTHORNE	346	340	347	335	382	378	388	388	370	368	428	421	441	443	428	417	491	496
HIGHLAND	335	343	337	340	372	377	391	375	375	355	440	413	431	420	415	406	487	463
HOLMES	330	325	328	319	363	363	381	378	362	358	420	416	425	421	418	414	485	474
IRVING	336	340	332	330	379	384	392	400	368	361	451	450	432	439	412	412	492	474
JEFFERSON	322	323	322	323	364	357	368	370	355	355	412	399	410	413	389	392	452	458
JORDAN	348	350	332	341	385	390	403	401	378	374	450	436	457	436	435	414	519	485
KELLER	333	331	332	332	371	367	386	367	376	357	452	409	422	415	397	399	460	464
LEHI	331	333	335	330	369	384	368	361	365	348	412	399	411	412	396	386	454	436
LINCOLN	337	342	334	336	376	382	365	378	357	368	397	413	403	412	389	393	453	460
LINDBERGH	336	330	340	326	383	361	401	370	378	357	455	416	415	408	417	399	480	459
LONGFELLOW	325	338	331	332	377	372	380	388	365	363	428	439	405	413	399	390	445	444
LOWELL	309	318	315	317	347	346	385	359	369	357	436	400	412	409	420	409	472	471
MACARTHUR	351	345	346	340	397	385	409	405	384	375	469	455	458	441	434	425	513	495
POMEROY	343	331	337	329	381	373	383	388	370	354	439	421	422	430	400	396	466	460
REDBIRD	337	334	339	336	371	370	376	378	364	365	415	416	428	422	411	404	462	463
ROOSEVELT	349	344	338	333	395	388	401	384	380	367	457	438	430	428	409	398	483	473
SALK	329	322	332	329	377	360	381	390	368	363	433	416	429	427	415	403	486	468
STEVENSON	317	316	325	328	340	357	360	356	349	357	408	405	400	411	386	384	459	454
TAFT	330	331	328	329	375	375	383	386	373	372	443	430	406	411	403	403	451	460
WASHINGTON	348	339	342	331	390	379	391	389	370	364	445	433	444	434	420	416	490	481
WEBSTER	323	325	324	316	358	364	360	367	353	356	405	403	392	403	386	384	436	428
WHITMAN	332	329	332	319	374	361	388	369	367	346	435	405	403	411	374	383	443	455
WHITTIER	349	332	336	329	398	369	389	382	388	368	429	432	437	454	413	416	487	504
DISTRICT (School)	336	334	334	330	377	373	387	383	370	364	436	425	426	424	410	404	476	469
NORM (School)	316		320		365		372		359		413+		414		405		458+	

+Estimated Value

— Indicates a decrease from 1981 to 1982

○ Indicates below national norm

California Achievement Test (CAT)
Mean Scale Scores

School	Grade 4 Total Reading 82	81	Grade 4 Total Math 82	81	Grade 4 Total Grammar 82	81	Grade 5 Total Reading 82	81	Grade 5 Total Math 82	81	Grade 5 Total Grammar 82	81	Grade 6 Total Reading 82	81	Grade 6 Total Math 82	81	Grade 6 Total Grammar 82	81
ADAMS	454	(433)	(439)	(422)	501	(475)	493	483	491	485	548	525	519	512	527	532	547	538
ALMA	476	460	452	(437)	530	508	502	502	481	476	545	535	539	542	527	522	572	573
CRISMON	476	475	462	452	531	517	509	503	488	479	548	542	534	534	534	512	576	559
EDISON	465	461	492	(431)	(443)	502	495	513	488	491	536	544	534	535	531	525	556	557
EISENHOWER	456	(434)	(434)	(422)	497	(475)	(477)	(467)	(466)	(462)	519	(505)	521	527	522	(495)	543	579
EMERSON	(453)	472	442	440	498	511	491	500	480	473	523	531	527	527	520	512	565	546
FIELD	481	475	468	458	545	528	515	524	485	502	558	565	543	539	523	526	583	569
FRANKLIN	483	462	478	454	549	528	514	501	532	498	584	567	544	526	543	532	575	563
HALE	484	470	469	452	532	517	511	512	507	494	574	556	555	547	549	544	592	590
HAWTHORNE	464	472	443	(435)	506	506	524	507	506	486	563	544	541	534	543	530	573	553
HIGHLAND	466	460	465	449	529	511	503	506	494	481	551	552	524	535	523	532	559	556
HOLMES	468	(451)	467	(438)	534	505	489	492	(470)	(472)	527	527	520	527	520	515	549	540
IRVING	469	471	458	453	533	522	508	504	474	473	538	543	541	535	541	528	571	574
JEFFERSON	(439)	(437)	(414)	(421)	(481)	(467)	(469)	(474)	(454)	(462)	(503)	(510)	(506)	(487)	508	(491)	(524)	(515)
JORDAN	484	469	447	440	523	516	523	510	506	485	572	551	544	523	540	530	582	566
KELLER	467	(451)	451	(434)	513	(492)	491	484	482	(472)	534	520	514	520	537	536	553	553
LEHI	458	455	443	(434)	501	502	495	479	498	(456)	563	(506)	523	(504)	513	504	552	543
LINCOLN	462	(438)	444	(414)	500	(477)	(469)	(480)	(445)	(464)	(511)	518	(509)	512	511	525	553	543
LINDBERGH	462	482	(435)	453	502	537	506	495	502	(470)	558	541	521	536	512	514	545	554
LONGFELLOW	(442)	(443)	(426)	441	(483)	499	(477)	490	(467)	475	(509)	522	(511)	(510)	521	509	544	534
LOWELL	(439)	(441)	(421)	(420)	(482)	494	493	(448)	477	(440)	534	(492)	(508)	(510)	523	515	564	537
MACARTHUR	487	469	478	449	553	525	517	512	489	489	566	554	560	544	550	539	587	569
POMEROY	459	467	441	448	499	518	520	503	490	475	555	534	531	537	536	535	563	565
REDBIRD	471	467	443	(435)	512	505	485	504	(465)	(470)	531	537	529	530	514	525	547	560
ROOSEVELT	474	478	456	460	536	524	516	511	498	499	557	555	534	540	532	538	578	580
SALK	459	(453)	441	(429)	511	494	(477)	(479)	(466)	(462)	528	515	(510)	(510)	527	505	559	543
STEVENSON	(433)	(426)	(425)	(419)	495	(481)	(458)	(462)	(448)	(450)	(502)	(492)	(507)	(503)	(500)	(489)	537	537
TAFT	(441)	(449)	(433)	(436)	508	499	(476)	(473)	(472)	(464)	546	526	513	(505)	(502)	(496)	549	(523)
WASHINGTON	480	486	465	451	530	529	533	530	514	510	579	568	555	549	557	553	594	595
WEBSTER	(445)	465	(431)	453	(488)	510	499	(474)	474	(456)	531	(501)	(501)	(510)	(499)	516	538	(527)
WHITMAN	(451)	462	(431)	(436)	(487)	496	491	(473)	(472)	(454)	527	(504)	512	513	513	516	542	549
WHITTIER	487	474	459	439	529	505	491	516	488	488	521	547	528	513	511	494	549	537
DISTRICT (School)	464	460	449	439	511	505	497	494	483	475	542	532	527	524	525	523	560	554
NORM (School)	454		440		493+		482		473		514+		512		504		533+	

— Indicates a decrease from 1981 to 1982

+Estimated Value

◯ Indicates below national norm

area there are the following numbers below national norm (values below national norms are indicated by 0 in Table 7):

	1981	1982
Total Reading	50	41
Total Grammar	43	30
Total Math	68	41
	161	112

These statements are not meant to indicate that the elementary schools performed poorly on the CAT but only that there is room for improvement. In fact, if the converse of the statements is taken, one can see that summed over the three curriculum areas where 161 opportunities are below national norms in 1981, 415 are at or above national norms. Where the 112 are below national norms in 1982, 464 are above national norms. If one uses a stricter criteria, that is, school mean scores that are one standard deviation above national norms, the following results are obtained:

	Number One Standard Deviation Above National Norms	
	1981	1982
Total Reading	22	35
Total Grammar	40	65
Total Math	29	57
	91	157

Analyzing the information in Table 7 by individual school, one can see the great variability among the elementary schools within the Mesa District. In overall performance the range in the school performance is from that of Franklin and MacArthur with extremely high performance to schools at the other end such as Jefferson, Stevenson, Eisenhower, and Webster. Considering two measures of performance, the number of possible scores below national norms and the number of decreases from 1981-82, the following results were obtained. Summed over curriculum areas and grades, a given school has (3 curriculum areas x 6 grades x 2 years) 36 separate scores which can be compared to national norms and 18 opportunities for decrease. Franklin and MacArthur were the two schools that had 0 out of 36 means below national norms and 0 out of 18 decreasing from 1981 to 1982. Other schools with high performance were Crismon with 0 and 1, Hale with 0 below national norms and two decreases, Hawthorne with 1 and 3, Jordan with 0 and 3, and Washington with 0 and 2. A number of schools had 0 or 1 mean scores below national norms, but had a number of decreases from 1981-82. These schools are Alma with 1 and 5, Emerson with 2 and 6, Field with 0 and 6, Highland with 1 and 7, Irving with 0 and 7, Roosevelt with 1 and 6, and Whittier with 0 and 5. As the first number indicates, the overall performance of these schools compared to national norms is very positive. The second number, however, the number of decreases out of 18, indicates there may be cause for further investigation.

A number of schools are also showing definite improvement. For example, Adams had 12 of their mean scores below national norms but only two had decreases in their test scores. Of the 12 scores that were below national norms only two were scores from the 1982 school year, indicating a significant increase in performance. Lehi had 15 scores below national norms, but 10 of these were from 1981 data. In addition, only four decreases were observed among the possible 18. Salk with 10 mean scores below national norms had only 3 below national norms in 1982 and had only two decreases over the two year period. Likewise, Holmes Schools had eight below national norm in total but only two for 1982 with three decreases.

For those schools with lower performance, Jefferson had 30 of the possible 36 scores below national norms and 10 of the 18 showing decreases. Stevenson had 28 and 6, Eisenhower 25 and 4, and Webster 25 and 10. Eisenhower, although scoring below national norms on 25 out of 36 possible scores, showed improvement in 14 out of the possible 18 values.

Some schools that were in between in performance overall show some negative movement with respect to the number of scores decreasing. These schools are Edison which decreased in 12 out of 18 scores, Lincoln which decreased in 14, and Longfellow which decreased in 11 out of 18 and had 15 of their 36 scores below national norms.

SUMMARY

The California Achievement Test was administered to the students of the Mesa Public Schools in April, 1981, and again in April, 1982. This state-mandated test is administered to all students in grades 1 through 12.

The performance of the students at the elementary level in Mesa was very good. Increases were noted in almost all subtest areas and where decreases were observed they were slight. Considering the percent of elementary students at or above national norms, 80 percent of the first grade students in Phonic Analysis scored at or above. The lowest value was 59% of the Mesa students at or above national norms in 1982 in Math Concepts and Applications.

If information is summed over grades, considering the total elementary experience, it appears that the performance of Mesa students is well above national norms in all areas. In a relative sense, the two areas that performance is somewhat less than the others is Reading Comprehension and Math Concepts and Applications. If a similar analysis is performed by summing student performance over all subtests by grade and looking at performance by grade, the performance of the Mesa students is again well above national norms. Considering the information in a relative sense, the performance of two grades is somewhat lower than the others, these grades are the third grade and the fourth grade.

By subskill area with each subtest the Mesa students at the elementary level performed above national norms and in most areas improve their performance over the previous year in most skills. There were only three areas in which the performance, compared to national norms, was not significnatly above. These areas were:

Second Grade	Number Set Theory
Third Grade	Number Sentences and Properties Common Scales
Fifth Grade	Number Theory Number Sentences Number Properties Common Scales
Sixth	Number Properties

In addition to making comparisons to the performance of previous years or to the norm group one could set a given criteria for skill level performance and use this as a measure against which the performance of the Mesa students is at a 95 percent correct level, it is difficult to improve the performance. If, however, the performance is at the 50 percent correct level improvement can more readily be obtained.

As would be expected there is a wide difference when considering the performance of the Mesa Schools individually. Using a comparison between the school mean and the national norm mean for schools and a comparison between school performance in 1981 and school performance in 1982, a number of schools indicated excellent performance on both criteria. In turn a number of schools were noted that showed performance on one or both of these measures to be below that expected. That is, below national norms on the first comparison or a significant

decrease in test scores over the two year period on the second comparison. An attempt was made to identify those schools that fit into these categories.